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CONTENTS.

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HUNTERIAN LECTURE on the Surgical Complications of Typhoid and Paratyphoid Fevers. Delivered before the Royal College of Surgeons of England, by A. E. WEBB-JOHNSON, M.B., Ch.B. Manch., F.R.C.S.Eng., D.S.O., Lieut.-Col., R.A.M.C. (T.C.); Hunterian Professor of Surgery; Assistant Surgeon to the Middlesex Hospital..... 813

ORIGINAL ARTICLES.

Serum Disease after Intrathecal Injections of Serum. By H. D. ROLLESTON, C.B., M.D.Camb., F.R.C.P.Lond., Temporary Surgeon-General, Royal Navy; Senior Physician, St. George's Hospital.. 821

A Note on Serum Sickness in Cerebro-spinal Meningitis. By CLAUDE B. KER, M.D. Edin., F.R.C.P.Edin., Medical Superintendent, City Hospital, Edinburgh..... 822

Examination of the Urine in Cases of Relapsing Fever occurring in Macedonia. By LEONARD S. DUDGEON, F.R.C.P. Lond., Lieut.-Col., R.A.M.C. (Temp.); Consulting Bacteriologist. Salonika Army.—(*Illustrated*)..... 823

"Collosol" Cocaine. By G. BARGER, M.A., D.Sc., H. H. DALE, M.D., F.R.S., and FLORENCE M. DURHAM. (From the Department of Biochemistry and Pharmacology, Medical Research Committee.)..... 825

MEDICAL SOCIETIES.

ROYAL SOCIETY OF MEDICINE:
SECTION OF MEDICINE:—Manifestations of Serum Disease which may Follow Intrathecal Injections..... 826
SECTION OF OTOLOGY:—Exhibition of Cases and Specimens. — Gastro-intestinal Sepsis a Cause of Ménière's Symptoms 826
MEDICAL SOCIETY OF LONDON: Resumed Discussion on the Value and Limitations of Sanatorium Treatment for Tuberculosis..... 827

REVIEWS AND NOTICES OF BOOKS.

Lord Lister. By Sir Rickman John Godlee, Bart., K.C.V.O. 828

War-shock: the Psychoneuroses in War; Psychology and Treatment. By M. D. Eder, M.R.C.S., L.R.C.P. Lond., B.Sc., late Temporary Captain, R.A.M.C. 828

Encyclopædia Medica. Second edition. Vol. V.: Filix Mas to Heart..... 828

LEADING ARTICLES.

THE NUMERICAL POSITION OF THE MEDICAL STUDENT 829

THE SURGICAL COMPLICATIONS OF THE ENTERIC FEVERS..... 830

ANNOTATIONS.

Dr. Jameson 831
Electrically Heated Beds..... 831
The Death of Dr. Elsie M. Inglis..... 832
The Transmission of Plague by Bed-bugs 832
The Munition Workers' Food .. 832
Measles Considered as a Respiratory Disease 833
The Metropolitan Water-supply..... 833

THE GENERAL MEDICAL COUNCIL.

New Members 834
Presidential Address..... 834
Representation of Dentists on the Council..... 835

SPECIAL ARTICLES.

National Insurance: The National Health Insurance Bill. — The Insurance Act Pharmaceutical Service. — Panel Resignations in Cheshire 835

The Services: Royal Naval Medical Service. — Army Medical Service. — Royal Army Medical Corps..... 838

CORRESPONDENCE.

The Source of Spirochætes in Urine (Captain A. T. Nankivell, R.A.M.C., Captain C. E. Sundell, R.A.M.C.) 836

War Deafnesses (Dr. P. McBride) 836

Circinate Rashes after Antitoxin (Dr. Frederic Thomson) 837

Recurrent Attacks of Fever (Dr. George Parker)..... 837

Sir Richard Croft and the Case of the Princess Charlotte (Dr. S. D. Clippingdale)..... 837

THE WAR.

The Casualty List..... 838
Casualties among the Sons of Medical Men 838
The Honours List 839
Mentioned in Despatches..... 839
Queen Mary's Convalescent Hospital, Roehampton..... 839
Help for Wounded Sailors and Soldiers 839

OBITUARY OF THE WAR:
Kenneth Angus MacCuish, M.D. Nova Scotia, Captain, Canadian Army Medical Corps..... 839
John Beaufoy Randall, B.Sc., M.B., B.S.Lond., Captain, Royal Army Medical Corps. —(*With Portrait*)..... 839

OBITUARY.

Franklin Paine Mall, M.D. Mich., Professor of Anatomy at the Johns Hopkins University, Baltimore 841
Edward Burd, M.D., M.C. Camb., Consulting Physician to the Royal Salop Infirmary..... 841
Timothy Henry Martin, M.R.C.S Eng., L.S.A. 841
Peter MacGregor, L.R.C.P. Edin., F.R.C.S.Edin., Major, R.A.M.C 839

URBAN VITAL STATISTICS:
English and Welsh Towns.... 840
Scotch Towns..... 840
Irish Towns..... 840
Vital Statistics of London during October, 1917 840
Analysis of Sickness and Mortality Statistics in London during October, 1917..... 840

MEDICAL NEWS.

Donations and Bequests 825
Appeal for the Queen's Hospital for Children 835
Society of Apothecaries of London: Pass-list..... 841
Medical Society of London..... 841
Hunterian Society 842
Harveian Society of London 842
Society for the Study of Inebriety 842
Centenarian 842
Central Midwives Board 842

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: The National Health Insurance Bill..... 842
House of Commons: Review of Exceptions Act.—Medical Students in the Royal Navy. —Infant Welfare Legislation. Drill of R.A.M.C. Officers.—Distribution of R.A.M.C. in France. - Surgeon-General Sir A. Sloggett. — Supplies of Carbide of Calcium.—Yorkshire Practitioners and Invalided Soldiers. — Medical Boards 842

Appointments 843
Vacancies 843
Births, Marriages, and Deaths... 844
Meteorological Readings..... 844
Notes, Short Comments, and Answers to Correspondents... 844
Medical Diary 845
Editorial Notices..... 846
Manager's Notices..... 846
Acknowledgments of Communications received 846

FOR INDEX TO ADVERTISEMENTS SEE PAGE 2.

MATERNITY AND CHILD WELFARE. A Monthly Journal for Workers among Mothers and Children. 6d. net; post free 7d. Annual Subscription 6s. post free.

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INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

BAILLIERE, TINDALL & COX:—
Beddoes' Prescribers' Formulary and Index of Pharmacy.. Cover 1
Bellamy Gardner's Surgical Anæsthesia ..... Cover 1
Blomfield's Anæsthetics .. Cover 1
Cobb—The Organs of Internal Secretion ..... Cover 1
Jung's Analytical Psychology Cover 1
Lockhart-Mummery—Diseases of the Colon ..... Cover 1
Tinel's Nerve Wounds .... Cover 1

BALE, SONS & DANIELSSON:—
Daniels & Newham—Studies in Laboratory Work 1
De Quervain—Clinical Surgical Diagnosis 1
Fantham, Stephens, & Theobald—The Animal Parasites of Man 1
Hutt—The Future of the Disabled Soldier 1
Maternity and Child Welfare 1

CASSELL & CO.:—
Walker—Surgical Diseases, &c., of Genito-Urinary Organs.. Cover 1

PAGE

CHURCHILL J. & A.:—
Beatty—Enzyme Action 5
Bennett—Medical and Pharmaceutical Latin 5
Bowlby, Sir A. A., and Andrewes—Surgical Pathology, &c 5
Box—Post-Mortem Manual 5
Cameron—Diet, &c., in Infancy .. 5
Edelmann—Meat Hygiene 5
Haig—Uric Acid in the Clinic 5
" Uric Acid as a Factor in the Causation of Disease 5
Haig—Uric Acid an Epitome.... 5
Hale White's Materia Medica 5
Hare—Alcoholism ..... Cover 1
Hartridge—Ophthalmoscope 5
" Refraction of the Eye. 5
Lee—Microtomist's Vade Mecum. 5
Lucas—Book of Prescriptions 5
Lucas & Stevens' Book of Pharmacopœias 5
Panton—Clinical Pathology..... 5
Parsons—Diseases of the Eye 5
Potts—Medical and Surgical Electricity 5
Tognotte—Reagents and Reactions 5
Transactions of the Ophthalmological Society of the United Kingdom 5

PAGE

FROWDE AND HODDER & STOUGHTON:—
Riviere — Pneumothorax Treatment of Pulmonary Tuberculosis Cover 1

KIMPTON:—
Roth—Military Orthopædics Cover 1

LEWIS & CO.—
Copestake—Massage 3
Delorme—War Surgery 3
De Swiecicki-Nowski—Mechano-Therapeutics 3
Emery—Clinical Bacteriology and Hæmatology 3
Lewers—The Diseases of Women. 3
Kenwood—Public Health Laboratory Work 3
Magill—Galvanism and Faradism 3
Martindale and Westcott—The Extra Pharmacopœia 3
Parkes & Kenwood—Hygiene, &c. 3
Scott—Modern Medicine..... 3

MACMILLAN & CO.—
Cohen—Organic Chemistry 4
Godlee, Sir R. J.—Lord Lister.... 4
Luciani—Human Physiology 4
New System of Gynæcology 4

PAGE

MEDICAL PUBLISHING CO.:—
Lane, Sir A.—Operative Treatment of Fractures ..... Cover 1

MILLS & BOON:—
Ash—How to Treat by Suggestion ..... Cover 1
Ash—Mental Self Help .... Cover 1

SAUNDERS COMPANY:—
Surgical Clinics of Chicago Cover 1

TRUE TEMPERANCE ASSOC.:—
Crichton Browne, Sir J.—What we Owe to Alcohol 4

WRIGHT & SONS (BRISTOL):—
Index of Differential Diagnosis of Main Symptoms..... Cover 1

MEDICAL LIBRARIES, &c.:—
Baker—Books..... 4
Behnke—Stammering, &c..... 4
Ketley—Stammering 4
Matthews—Wood: Application of Trusses to Hernia 4
Medical Correspondence College—Guide to Medical Examinations 48

OFFICIAL AND GENERAL ANNOUNCEMENTS

ASSISTANCIES MEDICAL 55

ASYLUMS, HOMES, &c.:—
Ashwood House, Kingswinford .. 50
Barnwood House Hospital..... 53
Bishopstone House, Bedford 53
Brunton House, Lancaster..... 53
Camberwell House, Peckham road 51
Clarence Lodge, Clapham Park .. 53
Colthurst House School, Alderley Edge..... 53
Coppice, The, Nottingham..... 50
Court Hall, Kenton, near Exeter. 50
Dalrymple House, Rickmansworth 51
Dartmoor Sanatorium 52
David Lewis Colony, Alderley Edge 55
Duff House, Banff 52
General Manager, Craven-street.. 53
Ghyllwoods Sanatorium 51
Grove House, Church Stretton .. 50
Grove, The, Catton, Norwich 50
Haslemere Nursing Home 53
Haydock Lodge, Newton-le-Willows 51
Heigham Hall, Norwich 50
Littleton Hall, Brentwood..... 53
London Fever Hospital 50
Malling Place, Kent 50
Melbourne House, Leicester..... 51
Mendip Hills Sanatorium 52
Mont House, Tamworth 50
Newmains Retreat, Lanarkshire.. 51
Nordrach-on-Dee, Banchory 52

ASYLUMS—(Continued).
Northumberland House, Finsbury Park 53
Northwoods House, Winterbourne 51
Peckham House 51
Pendyffryn Hall Sanatorium, Nordrach-in-Wales 52
Plympton House, Plympton 50
Portsmouth Corporation Mental Hospital 53
St. Andrew's Hospital, Northampton 50
Shaftesbury House, Formby-by-the-Sea 51
Sharman, Beaumont-street 53
Springfield House Private Asylum, Bedford 53
Stretton House, Church Stretton. 50
The Grange, near Rotherham 50
Vale of Clwyd Sanatorium 52
Warneford Asylum, Oxford 53
Wye House, Buxton 50

FINANCIAL, &c.—
Equitable Reversionary Interest Society 47

HEALTH RESORTS, BATHS, &c.:—
Caterham Sanitarium 53
Smedley's, Matlock..... 53

HOSPITAL, INFIRMARY, SANATORIUM, &c., VACANCIES.. 53-55

HOUSE & ESTATE AGENTS:—
CONSULTING-ROOMS:—
L. M., Hertford street 56
No. 540, L.O., Strand 56

LIFE & FIRE ASSURANCES, &c.:—
Prudential 47

MEDICAL ACCOUNTANTS, &c.:—
Turner 56

MEDICAL AGENTS:—
Fieldhall, Limited 57
Manchester Clerical, &c., Assoc... 57
Medical Agency..... 57
Needes, J. C. 57
Peacock & Hadley 57
Turner..... 57

MEDICAL SCHOOLS:—
(LONDON.)
London School of Clinical Med. .. 47
St. Mary's Hos. Medical School .. 47
West London Post-Graduate Coll. 47

NURSES' ASSOCIATIONS:—
Co-operation of Temperance Male and Female Nurses..... 49
Female Nurses Association 49
General Nursing Association 49
Hospital for Sick Children 50
London Nurses' Association..... 49
London Temperance Nurses Co-operation 48

NURSES' ASSOC.—(Continued).
Mental Nurses Association 49
Mental Nurses' Co-operation 48
Misses Strongwick's Nursing Agency 48
New Mental Nurses' Co-operation 48
Nurses' Association 49
Nurses' Co-operation..... 49
St. John's House 48
St. Luke's Hospital 48
Temperance Association of Male Nurses, Ltd. 49
Temperance Male Nurses Co-operation 48
The Retreat, York 48

OFFICIAL NOTICES:—
City of London Lying-in Hospital 47
College of Preceptors 47
Incorporated Society of Trained Masseuses 47
London School of Tropical Med... 47
Queen Charlotte's Lying-in Hosp. 47
Royal Society 47
York-road General Lying-in Hos.. 47

PARTNERSHIPS & PRACTICES. 56

RAILWAY & STEAMSHIP CO.'S.:—
Royal Mail Steam Packet Co. 47

TUTORS & LECTURERS:—
Medical Correspondence College. 48
Weymouth 47

TRADE AND MISCELLANEOUS ADVERTISEMENTS

AMBULANCES:—
Daimler Company—
Motor Ambulances for Hire 8
St. John Ambulance—
Invalid Carriages..... 57

BOTTLE MERCHANTS:—
Isaacs 57

CARRIAGES, MOTORS, &c.:—
Armstrong—Liveries 56
Brown Brothers, Ltd.—
Broit Electric Engine Starter .. 8
Douglas Bros.—Motorcycle 9
Michelin Tyres 7
Offord & Sons—Ford Cars 57
Singer & Co., Ltd.—Doctor's Car.. 8

CHEMISTS & DRUGGISTS:—
Allen & Hanburys—
Allenburys Cod-Liver Oil, &c. .. 25
Azoule Pituitarin, &c. 24
Allenburys Castor Oil 40
Angier Chemical Co.—
Angier's Emulsion 17
Anglo-American Oil Co.—Nujol .. 10
Anglo-American Pharmaceutical Co., Ltd.—Peptenzyme..... 45
Anglo-French Drug Co—
Galyl, Latapie Sero-Reaction for Syphilis 32
Iodogénol 35
Antiphlogistine 30
Battley & Watts—
Battley's Liquors..... 11
Beghe & Chiapetta—Saurol 44
Boots Pure Drug Co.—
Chloramine-T Cream..... 22
British Oxygen Co.—Oxygen..... 40
Browning & Co.—Somprulin Emulsion with Iron ..... Cover iii
Burroughs Wellcome & Co.—
Kepler Malt Extract 27
Tabloid Brand Medical Outfits.. 28
Tabloid Outfits for Gifts 29
Carnrick (G. W.) Co.—
Trypsogen 31
Christy & Co.—Glyco-Heroin..... 40
Clin, Paget & Co.—Glycolacetophos 40
Clement & Johnson—"Yadil" Antiseptic..... 19

CHEMISTS—(Continued).
Cook & Co.—
Cofectant Lozenges .... Cover ii
Cooper Laboratory for Economic Research—
Phenol sulphone-phthalein 44
Duncan, Flockhart & Co.—
Organo-Therapeutical Preparations..... 13
Etablissements Poulenc Freres—
Stovaine 11
Fassett & Johnson—
Emol-Keleet 58
Ferber Ltd.—Bienosan Capsules.. 41
Gale & Co.—Elixir Cresolis c. Heroin Co., &c 42
Genatosan, Ltd.—
Sanatogen and Formamint 21
Heppells—Urodonal, &c..... 20
Hewlett & Son—
Liq. Santal Flav. c. Buchu et Cubeb, &c. 26
Hogg & Son—
Protein Nerve Food 38
Hudson's Eumenthol Chemical Co.—Eumenthol Tooth Powder 42
Humphrey Taylor & Co.—Junora. 42
Maltine Manufacturing Co.—
Maltine ..... Cover iv
Martindale—Tinct Ixora 40
Moore & Co., Limited—
Lymm Pure Salts 43
Parke, Davis & Co.—
Pollacasan, &c. 22
Price's Patent Candle Co., Ltd.—
Price's Night Lights 41
Raimes & Co - Slinger's Nutrient Suppositories 44
Richards & Sons—
Antikamnia Tablets 10
Tidman's Sea Salt 40
Wander, Ltd.—Malt Extract with Paraffin 12
Wilcox, Jozeau & Co—
Native'le's Crystallised Digitaline 45
Riodine 44

DISINFECTANTS:—
Condy's Fluid 46
Cuibeil Bros.—Kerol..... 45

FOODS:—
Aylesbury Dairy Co.—
Humanized Milk..... 39
Benger's Food 16
Blatchley's Diabetic Preparations 38
British Milk Products Co.—
Sanaphos 18
Cadbury's Cocoa 31
Carnrick & Co.—Dry Peptonoids, Liquid Peptonoids .... Cover iv
Freeman's Egg Substitute..... 38
Glaxo 14
Hon mel's Hæmatogen .. Cover iii
Jardox Beef Tea 58
Lyons & Co.—Cafesco..... 15
Sowthall Bros. & Harrisy—Vitafer 38
Thew, Hooker & Gilbey, Ltd.—
Malted Milk 58
Valentine's Meat-Juice .. Cover ii
Van Abbott & Sons — Gluten Bread, &c. 39
Van Houten's Cocoa..... 39
Vitamogen Ltd.—Vitamogen 35

FURNITURE, &c.:—
Carters—Furniture for Invalids and Hospital Supplies..... 34

HOSIERS, &c.:—
Wolsey Underwear..... 36

HOSPITALS (ISOLATION):—
Humphreys, Limited—
Hospital Buildings, &c. 37

MED. & SURG. APPLIANCES:—
Bailey & Son—Operation Tables and Sterilizers 31
Davis—Lukens Sterile Catgut.... 6
Davis & Geck—Kalmeric Catgut. 48
Ernst—Surgical and Orthopædic Appliance, &c. 48
Favarger & Co.—Albee Electro-Operative Bone Set..... 35
Hearson & Co.—
Hearson's Specialities..... 35
McBride & Co.—Kidney and Abdominal Protector 57
Millikin & Lawley—Osteology, &c. 48
Norwich Crape Co.—
Norwich Crepe Bandage 6

MED. APPLIANCES—(Continued).
Robinson & Sons—Gamgee Tissue 57
St. Dalmas & Co.—Leicester Plaster-of-Paris Bandages..... 34
Timpson & Co.—
Reliable Ligatures 45
Wormall—System of Aluminium Splinting 48

MINERAL WATERS, &c.:—
Contrexéville Pavilion 44
Davis & Davis—Natural Mineral Waters 38
Vichy-Célestins 39

OPTICIANS:—
Watson & Sons, Ltd.—
Hæmacytometers..... 46

STATIONERY, &c.:—
Mable, Todd & Co.—
Swan Fountpens 45

TAILORS, BOOTMAKERS, &c.:—
Dowie & Marshall—
Hygienic Bootmakers 46
Harry Hall — Service Dress R.A.M.C. and Navy 57

VACCINE LYMPH:—
Chaumier's Calf Lymph 6
Heinemann—Rebman's Pure Aseptic Calf Lymph 6

WINES, BEER, SPIRITS, &c.:—
Humphrey Taylor & Co.—
"G. B." Diabetes Whisky 42
Pellison Père & Co.—
Pure French Wine Brandy 58

X-RAY, &c., APPARATUS:—
Medical Supply Association—
Greville's Intensified Induction Transformers..... 36

MISCELLANEOUS:—
Bates—Rubber Gloves Repaired, &c. 6
Marsh—Disarticulated Skull 56
No. 805, L.O., Strand—Chauffeur.. 56

Hunterian Lecture

ON THE

SURGICAL COMPLICATIONS OF TYPHOID AND PARATYPHOID FEVERS.*

Delivered before the Royal College of Surgeons of England on March 5th, 1917,

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MR. PRESIDENT, LADIES, AND GENTLEMEN,—When I informed the Army medical authorities that you had done me the honour of electing me Hunterian professor, and that the subject of my lecture was to be the Surgical Complications of Typhoid and Paratyphoid Fevers, I was asked to deal with the subject fully and to make as detailed and as comprehensive a review as possible of our experience at No. —— Stationary Hospital, the principal British hospital in France for the treatment of these fevers. I have completed this task and propose to publish the review in full, but in this theatre I thought it would be more suitable and appropriate if I confined my lecture to a general discussion of the subject and only attempted to give a detailed account of those complications which are of special surgical interest or have an important relation to the many problems associated with the typhoid group of fevers.

HISTORICAL OUTLINE.

An inquiry into the early records of typhoid fever in this country opens some interesting pages of English history. In war we first find evidence of the disease in 1643, when the ranks of the Parliamentary forces were thinned by an outbreak of infection, from which King Charles's followers also suffered and which they carried with them to the Royalist stronghold at Oxford. Here Thomas Willis was serving the King in the University Legion, and from the detailed account which he gave of this epidemic in his classical work, "De Febribus," there is no doubt that the disease was typhoid fever. This is the same Willis whose name is so familiar to us from the anastomosis of the main cerebral arteries at the base of the brain being named after him.

Since the time of this, its first known appearance in war, typhoid fever has been a menace to armies in all campaigns of any duration and has often cost the British Army dear. In peace as well as in war, however, we have suffered as a nation from the ravages of this disease, which has attacked members of our Royal House on more than one occasion. The very first case which allows of clear demonstration was that of Henry, Prince of Wales, eldest son of King James I., who died in 1612 of a fever epidemic at that time. For the careful description of the illness and the post-mortem appearances, which enabled Dr. Norman Moore to identify the disease as typhoid fever, we are indebted to that distinguished French physician, Sir Theodore de Mayerne, who was in attendance on the Prince during the last part of his illness.

Passing to a time within the memory of some of us we find typhoid fever making us mourn the loss of Prince Albert in 1861, while King Edward, when Prince of Wales, was brought to the brink of the grave by an attack of the same disease ten years later. Among the physicians in attendance on these Royal patients was Sir William Jenner, whose work at the London Fever Hospital from 1847 to 1851 did so much to help in the differentiation of the continued fevers. In 1862 Dr. Charles Murchison, who was then on the staff of the Middlesex Hospital and, like William Jenner, on that of the London Fever Hospital, published his classical work, "The Continued Fevers of Great Britain," which became at once a standard authority and still maintains a prominent place in the literature of the subject. The third edition was edited by another physician to the Middlesex and the London Fever Hospitals, a great authority on these fevers who died only last year, Dr. William Cayley.

* The lecture was illustrated with numerous lantern slides.

Morbid Anatomy and Bacteriology.

The characteristics of the continued fevers generally and of typhoid fever in particular became well recognised owing to careful clinical study and the methodical investigation of morbid anatomy, to which work it would be surprising indeed if we did not find some contribution from John Hunter. Reference to the Hunterian manuscripts shows that Hunter in the course of his "Dissections of Morbid Bodies" gave close attention to the morbid anatomy of this disease, and in the Museum of this College are 13 specimens of the intestinal lesions from Hunter's original collection.

After Hunter, Paget. He was amongst the first to realise the large and interesting field for surgical investigation in the complications and sequelæ of the continued fevers. The first surgeon to give this subject the careful study which Paget saw it deserved was William Keen, of Philadelphia, who discussed it in his Toner lecture of 1876, and whose well-known work, "The Surgical Complications and Sequels of Typhoid Fever," was published in 1898. Between the two dates an epoch-marking discovery was made when in 1880 Eberth demonstrated the *Bacillus typhosus*. During the next decade, with the discovery of other closely allied organisms such as the *Bacillus coli communis*, the bacilli of meat poisoning and others, it became evident that there existed a group of bacilli which were practically identical with the *Bacillus typhosus* morphologically, but which differed in their cultural reactions and pathogenetic properties. A new chapter in the history of the typhoid problem was opened by the discovery of organisms which closely resembled the *Bacillus typhosus*, produced identical symptoms and post-mortem appearances, and yet were distinguishable from it. In 1896 Achard and Bensaude isolated organisms, which they called paratyphoid bacilli, from two patients with typhoid-like fever. In 1898 Gwyn cultivated a similar bacillus from the blood of a patient with symptoms of typhoid fever, and in 1901 Schottmüller described five cases of what was apparently typhoid fever, and in which he had found two species of paratyphoid bacilli. These organisms were named the *Bacillus paratyphosus A* and the *Bacillus paratyphosus B*, forming with the *Bacillus typhosus* a sub-group of the large coli-typhoid group of organisms.

It has been established that the bacilli of the typhoid sub-group are distinct specific micro-organisms, and the diseases to which they give rise are known as typhoid fever, paratyphoid A, and paratyphoid B. In the words of Sir Bertrand Dawson[1]:—

"Looked at broadly, paratyphoid is typhoid fever in miniature. A patient invaded by it stands to be ill less severely and for a shorter time, is less prone to complications, and, *a priori*, less likely to die. It presents a clinical picture which is suggestive, though not absolutely distinctive, and its certain diagnosis from typhoid can only be made with the aid of bacteriological findings," but, "though habitually milder, paratyphoid may present the gravity of severe typhoid."

Paratyphoid A is a milder disease than paratyphoid B, which is the form of paratyphoid fever usually encountered in the Western hemisphere.

DIAGNOSIS: BLOOD PICTURE.

For my analysis of the surgical complications of these fevers I have studied the cases admitted to No. —— Stationary Hospital during the first two years of its existence as an isolation hospital, and have used the 2500 which have been diagnosed definitely as either typhoid, paratyphoid A, or paratyphoid B.

TABLE I.

Disease.	Number of cases.	Deaths.	Mortality, per cent.
Typhoid, inoculated	821 } 1118	27 } 84	3·28 } 7·51
,, not inoculated	297 }	57 }	19·19 }
Paratyphoid A, inoculated ...	123 } 344	0 } 1	0 } 0·29
,, not inoculated...	221 }	1 }	0·45 }
Paratyphoid B, inoculated ...	239 } 1038	1* } 18	0·41 } 1·65
,, not inoculated...	799 }	17 }	2·12 }
Totals	2500	103	4·12

* This patient had lympho-sarcoma.

In many cases, especially in the inoculated, it has not been possible to isolate the infecting bacillus, and we have been dependent for the confirmation and establishment of

the diagnosis on examinations of the patient's serum and the determination of its agglutinating power on the different organisms of the typhoid group. The fact that agglutinins are produced in response to preventive inoculation makes it more difficult to determine whether an inoculated individual is suffering from a typhoid group infection, and, if so, to which organism the infection is due. By means of Dreyer's delicate technique the difficulties of diagnosis have been overcome. The amount of any specific agglutinins present in a patient's serum can be determined with accuracy, and, with few exceptions, by repeated measurement and study of the variations in the agglutinating power of a patient's serum it can be shown what organisms of the typhoid group, if any, are the cause of his illness.

Before discussing the surgical complications a word about the blood picture associated with these infections. As in tuberculosis and influenza and other diseases caused by bacilli, the reaction of the cellular elements of the blood to infection by typhoid or paratyphoid bacilli consists of an increase in the number of lymphocytes at the expense of the polymorphonuclear cells. This change is progressive, and owing to the diminution in the number of polymorphs an actual leucopenia may be produced. When surgical complications supervene this leucopenia is replaced by a leucocytosis with an increase in relative and absolute number of the polymorphonuclear leucocytes, but the number of these cells and the degree of leucocytosis are not so high as are met with in surgical conditions not associated with a bacillary infection.

INTESTINAL HÆMORRHAGE.

Table II. shows the incidence of intestinal hæmorrhage. It demonstrates, like Table I., the greater severity of typhoid as compared with paratyphoid fever, and shows that paratyphoid B is a more severe disease than paratyphoid A. It

TABLE II.—*Intestinal Hæmorrhage.*

Disease.	No. of cases	Hæmorrhage.	Percentage.	Fatal.
Typhoid, inoculated	821	10	1·21	5
,, not inoculated	297	40	13·46	21
Paratyphoid A, inoculated ...	123	0	0·0	0
,, not inoculated...	221	1	0·45	0
Paratyphoid B, inoculated ...	239	1	0·41	0
,, not inoculated...	799	15	1·87	4
Totals	2500	67	2·68	30

also illustrates a point to which I will return—the remarkable effect of inoculation in diminishing the severity of the illness. Though it has been suggested that hæmorrhage from an intestinal ulcer might be dealt with by operation, this course can seldom be practicable. The surgical interest of intestinal hæmorrhage lies rather in its relation to other complications which are essentially surgical in their nature and treatment.

INTESTINAL PERFORATION.

Perforation of the intestine is one of the most formidable and most urgent of the surgical complications of these fevers. The usual frequency in typhoid is once in about every 30 to 40 cases and since it is commoner in males of between 20 and 30 years of age, it will be seen that in the present series (Table III.) the incidence has been small.

TABLE III.—*Intestinal Perforation.*

Disease.	Number of cases	Cases of perforation.	Percentage.	Cases of operation.	Recovered.	Died.	Day of disease on which perforated.
Typhoid, inoculated	821	3	0·36	2	0	3	13th, 17th, 22nd,
,, not inoculated ...	297	6	2·02	1	0	6	27th, 28th, 31st, 39th, 51st, 70th.
Paratyphoid A, inoculated ...	123	0	0·0	0	0	0	
,, not inoculated	221	2	0·90	1	1	1	25th, 30th.
Paratyphoid B, inoculated ...	239	0	0·0	0	0	0	
,, not inoculated	799	3	0·37	2	0	3	12th, 23rd, 33rd.
Totals	2500	14	0·56	6	1	13	—

While in ambulatory cases perforation may be the first sign of illness it occurs most frequently in the third week. It has been reported as early as the eighth and as late as the 110th day. In the present series 8 out of 14 cases occurred during the fourth and fifth weeks, while one was as early as the twelfth, and another as late as the seventieth day.

As a rule, there are about five cases of ileal perforation to one in the rest of the intestinal tract, but in this series (Table IV.) the proportion of ileal perforations was by no

TABLE IV.—*Site of Intestinal Perforation.*

Disease.	Last 2 feet of ileum.	Ileo-cæcal.	Cæcum.	Appendix.	Descending colon.	Pelvic colon.
Typhoid	5*	2†	1	1†	0	1
Paratyphoid A ...	1	0	0	1	0	0
Paratyphoid B ...	1	0	0	0	1	1
Totals	7	2	1	2	1	2

* In one of the ileal cases there were three perforations.
† In this case there were two perforations.

means so great. In paratyphoid fever the large intestine is involved to a greater extent and is more severely affected than is usual in typhoid and in three out of five cases of perforation in paratyphoid the opening was in the large bowel.

Perforation occurs, as a rule, when the sloughs are separating. The opening is nearly always small and will often only admit a pin. In some cases a cribriform opening is found. Sometimes the peritoneal coat is included in the slough when the perforation is large and generally round or oval.

It is important to be specially on the look-out for symptoms of perforation in severe cases during and after the second week, and particularly in those who have marked tympanites or diarrhœa or have suffered from intestinal hæmorrhage.

Table V. shows the relation of perforation to hæmorrhage in the present series of cases, and it will be seen that nearly a third of the cases of perforation had also suffered from hæmorrhage.

TABLE V.—*Relation of Intestinal Perforation to Hæmorrhage.*

Disease.	Number of cases.	Hæmorrhage.	Perforation.	Hæmorrhage and perforation.
Typhoid	1118	50	9	3
Paratyphoid A ...	344	1	2	0
Paratyphoid B ...	1038	16	3	1
Totals	2500	67	14	4

Diagnosis and Treatment of Perforation.

The diagnosis of perforation may be extremely difficult. In obvious cases which are rare there may be all or most of the symptoms and signs of an acute abdominal lesion, but with the usual small perforation in a patient whose sensations are blunted by toxæmia symptoms may be slight or even absent, and perforation has been found at post-mortem examination when the condition was unsuspected during life. On this occasion I will not go any further into the question of diagnosis than to say that it is important for every aid to be enlisted in cases of doubt, and a blood count may be of great use, especially if repeated observations have been made previously, for then smaller changes will be appreciated. Also, since early diagnosis and treatment are essential to success, it is imperative that the surgeon should have the opportunity of seeing the patient when there is the slightest suspicion of perforation having occurred. It is no use waiting until symptoms are well established, for then it may be too late and the case past hope.

"Delays have dangerous ends"—so much so that in a doubtful case the abdomen should be explored. No harm is likely to be done and life may be saved. It is far better to open the abdomen and find no perforation than for a post-mortem examination to reveal one which could have been closed, perhaps with success.

The usual result of perforation if left alone is general peritonitis, but in very rare instances we find evidence of localisation of the infection or protective plastic peritonitis preventing leakage of intestinal contents. Two of our cases showed signs of an attempt by nature to prevent or limit

infection of the peritoneum. One of them had intestinal obstruction, the possibility of which must be remembered, and a peritoneal band was found obstructing the ileum. The starting-point of the band was a small perforation in the last part of the ileum, to which the omentum had become adherent. One of Hunter's specimens shows this rare condition; there is a deep ulcer which is evidently about to perforate, but the base is protected by peritoneal adhesions.

These instances support the view that perforation may take place and the patient recover without operation, but they are of such exceptional occurrence that they do not warrant any departure from the universally accepted necessity for immediate laparotomy when a diagnosis of perforation is made.

Some Points in Technique.

While a detailed discussion of technique would be out of place on an occasion like this there are a few points to which I should like to call attention. Operation may be performed under local anæsthesia alone, but a combination of local or spinal analgesia with small doses of ether inhalation is preferable. A word with regard to the incision. An incision through the right rectus is favoured by some surgeons, but though an incision on the right side may be convenient for dealing with a perforation in the usual site—the last portion of the ileum near the cæcum—it may be extremely inconvenient in the case of perforation of the colon. As we have seen, the large intestine is more likely to be the seat of perforation in paratyphoid fever, so that in this disease, at any rate, and probably as a general rule, a mid-line incision will prove the most suitable. As a rule, the perforation is easily found. In nearly 90 per cent. of the cases it is single, but a search should be made for other openings, which, if present, are nearly always in an adjacent coil of intestine.

When the perforation is found it should be closed, as a rule, but if there is intestinal atony, or paresis, or symptoms of pseudo-ileus, it is a wise procedure to perform an enterostomy. The value of intestinal drainage in this condition has been emphasised in recent years. Good results have followed simple drainage of the peritoneal cavity when conditions were desperate and suture of the intestine out of the question.

In the present series the results have been disappointing. The patients were in an extremely critical condition, and operation was undertaken rather as a *dernier ressort* than with much expectation of success. A special factor which weighed against the patients in this series was the high percentage of cases in which the large intestine was the seat of perforation. The greater degree of sepsis in the large bowel would affect the mortality in perforation, as in other surgical conditions of this part of the intestine.

THE SPLEEN.

The spleen forms a prominent feature of the clinical picture and plays an important part in the pathology of the typhoid group of infections, but this viscus is seldom the seat of surgical complications, though focal necrosis is frequently found in fatal cases. That rare accident, spontaneous rupture of the spleen, has occasionally been observed in typhoid without any coexistent or previous malarial infection. Splenic abscess is a rare complication of typhoid and paratyphoid and is practically always, if not always, the result of infarction. In the present series there were three cases of splenic abscess. One occurred in typhoid and two in paratyphoid B. All the cases were fatal and the specific organisms were obtained from the pus in each case.

The greatest surgical interest of the spleen in these fevers is its relation to infection of the biliary passages and the persistence of bacilli in the body, to which I will return when dealing with the carrier problem.

THE LIVER.

The liver also performs important functions in fighting these infections and in fatal cases shows, as a rule, focal necrosis and parenchymatous degeneration, but abscess in this organ is extremely rare. Abscess may arise from a septic infection of the bile passages or infective emboli may reach the liver through the hepatic artery or portal vein. When the infection is carried by the hepatic artery the liver abscess is part of a systemic pyæmia with abscesses in other parts of the body. When the portal vein is the channel of infection there is generally a gangrenous inflammation of some part of the intestinal tract (nearly always the appendix) with thrombosis of the veins in the neighbourhood. Abscesses of the liver in these fevers may be multiple or single. If single, drainage may be provided and the outlook is not bad. In our experience there were two cases of liver abscess; both occurred in paratyphoid B. In one a fatal pylephlebitis followed an abscess round a gangrenous appendix; the pus yielded a pure culture of *Bacillus typhosus B.* In the other case the abscess ruptured into a bronchus and the pus was expectorated. Diplococci and short-chain streptococci were recovered from the pus. The patient did well and eventually returned to duty.

THE GALL-BLADDER.

The elimination of micro-organisms by the liver from the portal circulation and the excretion with the bile of those which are not destroyed goes on constantly during the course of these fevers. In fatal cases pure cultures of typhoid and paratyphoid bacilli are obtained from the contents of the gall-bladder with more certainty than almost any part of the body except the spleen and the bone-marrow. The bacilli may be found in the biliary tract without the patient ever having had symptoms of typhoid or paratyphoid fever, while an acute cholecystitis may be the sole manifestation of a typhoid group infection.

The gall-bladder may also be infected through its arterial blood-supply or by ascending infection from the intestine, but the constant excretion of the bacilli in the bile in the course of these fevers is a possible mode of infection even long after they have disappeared from the systemic circulation. As a rule the passage of these micro-organisms along the biliary tract gives rise to no symptoms or signs of inflammatory reaction, but definite cholecystitis occurs occasionally in the course of these fevers and may be associated with ulceration or even lead to perforation of the gall-bladder.

In such cases there is some question whether the infection carried by the bile leads to the ulceration, or whether the gall-bladder wall is infected by the blood stream and the ulceration is secondary. Probably the condition arises as the result of both methods of invasion.

Though a mild cholecystitis presumably occurs in a fair percentage of cases it is only possible to diagnose the condition with any degree of certainty in a few. In the present series there were 15 cases with more or less definite symptoms of cholecystitis. In only one case was surgical intervention necessary, and, curiously enough, the patient was one of the 14 women of the series.

In the third week of an attack of paratyphoid B the patient, aged 29, developed symptoms of acute cholecystitis. As symptoms persisted operation was decided on, and in the tenth week cholecystectomy was performed, the patient making a good recovery.

The gall-bladder was not enlarged. It contained turbid bile-stained fluid and there was a gall-stone the size of a nutmeg in the neck of the viscus. The omentum was adherent to the fundus, and in the wall nearest the liver was a diffuse infiltration round an abscess which communicated by a small opening in the mucous membrane with the cavity of the gall bladder. The mucous membrane was acutely inflamed with many petechial hæmorrhages under its surface. The *Bacillus paratyphosus B* was obtained in pure culture from the contents of the gall-bladder and from the abscess in its wall.

The stone was a practically pure cholesterin calculus, but was not examined bacteriologically until later when no micro-organisms were found. Possibly it was present before the attack, and may have been the predisposing cause of the cholecystitis, for though the patient had never had any symptoms referred to the gall-bladder before the third week of her attack of paratyphoid, she had suffered from appendicitic abscess three and a half years previously and may have had some infection of the biliary tract then.

We have evidence, however, that gall-stones may form rapidly and within the 60 to 70 days which elapsed in this case, between the time of onset of the paratyphoid and the time when operation was performed.

In Mignot's[2] experiments the formation of two cholesterin gall-stones in a dog took between 5 and 6 months. Hurst and Adams,[3] however, reported the case of a woman, aged 24, from whom 25 faceted cholesterin gall-stones were removed 70 days after the onset of typhoid fever. The *Bacillus typhosus* was obtained in pure culture from the contents of the gall-bladder and from the centre of some of the stones.

The treatment of typhoid cholecystitis is expectant, and surgical intervention is only called for if the symptoms and

signs do not subside or if there is evidence of gall-stone formation. Urotropine has been shown to be a valuable antiseptic for the biliary as well as for the urinary tract, and may be given in doses of as much as 20 grains three times a day. This drug may prove useful in preventing gall-bladder complications and is prescribed with advantage during typhoid and paratyphoid fever.

The main surgical interest in typhoid group infection of the gall-bladder is the occurrence of a mild catarrh which favours the production of gall-stones. Moreover, the infection may persist in the biliary tract for years after an attack of typhoid fever, and the *Bacillus typhosus* has been isolated from the contents of the gall-bladder when operating for gall-stones many years after recovery from the disease. The infection may also persist and linger in the biliary tract, apparently without causing any inflammatory reaction—a point to which I will return when discussing the carrier problem.

CARDIO-VASCULAR SYSTEM.

Of the cardio-vascular system I will say little. The subject of venous thrombosis, the commonest of the surgical complications in the circulatory system, was very fully dealt with in this theatre in Hunterian lectures delivered by Mr. Warrington Haward in 1906. In the present series we had the usual number of cases. (Table VI.) There was also

TABLE VI.—*Venous Thrombosis.*

Disease.	Number of cases.	Thrombosis.	Percentage.	Left side only.	Right side only.	Both sides.
Typhoid, inoculated	821	7	0·85	11	3	3
,, not inoculated	297	10	3·36			
Paratyphoid A, inoculated ...	123	0	0	2	0	0
,, not inoculated...	221	2	0·90			
Paratyphoid B, inoculated ...	239	3	1·25	19	2	2
,, not inoculated...	799	20	2·50			
Totals...	2500	42	1·68	32	5	5

the usual preponderance of cases affecting the left side. Keen was convinced that this preponderance was to be explained by the compression of the left common iliac vein where it passes under the right common iliac artery, and Mr. Warrington Haward showed, in addition, that the vein is also crossed by the left internal iliac artery, and that common and internal arteries cross almost at right angles in marked contrast to the relations on the other side.

I have one new point to bring to your notice in the treatment of thrombosis. Citrates are generally recommended, and Captain H. F. Marris has had many remarkably successful results by intravenous administration. He gives 10 ounces of a 0·5 per cent. solution of sodium citrate in saline, and repeats the dose if necessary at intervals of a few days. The dose seems very small, and at present the cases are too few to permit of any definite statement as to the advantages of this method of treatment, but some of the results have been very striking.

THE GENITO-URINARY SYSTEM.

Let us pass now to another excretory channel by which the bacilli of the typhoid group leave the body. In a large number of cases the bacilli are found in the urine at some

TABLE VII.—*Genito-Urinary Complications.*

Disease.	Number of cases.	Renal embolic abscesses.	Pyelitis.	Cystitis.	Prostatitis.	Epididymo-orchitis.	Totals.
Typhoid, inoculated	821	0	0	1	0	0	1
,, not inoculated	297	1	2	1	0	0	4
Paratyphoid A, inoculated... ...	123	0	0	0	0	0	0
,, not inoculated...	221	0	1	0	0	0	1
Paratyphoid B, inoculated... ...	239	0	0	0	0	0	0
,, not inoculated...	799	0	6	5	1	4	16
Totals	2500	1	9	7	1	4	22

period of the disease, generally about the third week or later, or sometimes not until convalescence. In typhoid they are found in about a quarter of the cases, but in paratyphoid the proportion is less, and in inoculated individuals it is smaller still. When bacilluria is present in the course of these fevers there may be no signs of inflammatory reaction in any part of the urinary tract, but in a certain number of cases there is some pyuria, though this often only amounts to the detection of a few pus cells in the urine.

The cases of urinary disease included in Table VII. comprise only those in which there were signs and symptoms directing attention definitely to some part of the urinary tract. In all these cases the specific infecting organisms were present in the urine.

Pyelitis and Cystitis.

Pyelitis and cystitis were diagnosed in 16 cases. The time of infection is generally about the third week, or later, and of the 16 cases 10 began after the third week. Cystitis usually followed an obvious pyelitis, and seemed to be due to a descending infection of the urinary tract. The *Bacillus paratyphosus B* proved more virulent than the other organisms of the group. There were not only more cases in paratyphoid B, but they were more acute and extensive. In one case of paratyphoid B the main stress of the illness fell on the urinary tract, starting with a very acute pyelitis, with some hæmaturia, followed by cystitis, and eventually a suppurating epididymo-orchitis occurred. Pure cultures of *Bacillus paratyphosus B* were obtained from the urine, and also from the pus from the abscess of the testis.

Typhoid and paratyphoid pyelitis and cystitis, as a rule, yield readily to treatment with urinary antiseptics—especially urotropine. In this series no case required local treatment. The excretion of typhoid-group bacilli may persist, however, for some time after the patient gets about, and to this point I will return when discussing the carrier problem, but there is another point which concerns surgeons more particularly, and that is, what influence this bacillary excretion may have in the etiology of surgical disease of the kidney. Micro-organisms pass through the kidneys in a large number of infectious fevers of every degree and severity, from the most acute like influenza to the most chronic like tuberculosis. The permeability of the kidney tissue is increased and albuminuria is common.

Bacilluria and slight pyuria are certainly commoner than has been generally taught, and since these conditions frequently arise in disease which, in their mildest forms, may easily be classed as more or less minor ailments a history of previous illness assumes an increased importance in the case of disease of the urinary tract. Only by a searching inquiry into the previous history and a routine bacteriological examination of the urine and of any parts of the urinary tract which may be explored at operation can we get a true idea of the part played by these specific bacteria in the etiology of urinary disease. Bacterial excretion may have some bearing on calculous disease of the kidney, for the epithelial débris and coagulable deposits resulting from one of these infections may furnish a nucleus for the deposit of salts which would otherwise have remained in solution in the urine. Davies and Walker Hall[4] have reported a case in which, over five years after an attack of typhoid fever, a woman who was a urinary carrier of *Bacillus typhosus* had her right kidney explored and ten calculi removed. The contents of the renal cavity yielded a pure growth of *Bacillus typhosus B*, and this organism was isolated from the calculi also. It is of great importance to increase our informatin on this subject, and renal calculi should always be submitted to bacteriological examination.

Epididymo-orchitis.

Epididymo-orchitis is an occasional complication and there were four cases in the present series. All occurred in paratyphoid B and the bacillus was obtained in pure culture from three of them, in which suppuration took place. Owing to the body of the testis being involved, as a rule, either alone or to the same extent as the epididymis, it has been taught that the infection in typhoid and paratyphoid is carried by the blood stream. But the organisms of these diseases give rise to so little infiltration that the infection might extend from the urinary tract to the seminiferous tubules before producing an inflammatory reaction. It is different with organisms like the gonococcus, the pyogenic cocci, and the tubercle bacillus which cause considerable thickening and infiltration along the path of their extension. In the case of tuberculous infection a focus of limitation is brought about first at the globus minor.

In the four cases under review it certainly could not be said that the epididymis was first involved or even markedly affected; in fact, the abscesses were all in the body of the testis. In each of the suppurating cases, however, there had been pyelitis and cystitis, and in the case which did not go on to suppuration there was a marked bacilluria and *Bacillus paratyphosus B* was obtained in pure culture from the urine of all of them. It seems therefore reasonable to conclude that the infection in these cases came from the urinary tract, and I believe that many cases which are attributed to infection from the blood stream can be accounted for in the same way.

PAROTITIS.

Parotitis is another complication which is mainly due to local conditions and not to blood infection. Accumulating evidence goes to show that infection extends to this gland through the parotid duct. No doubt infection may reach the parotid by the blood stream as well as by Stenson's duct, but the great majority of cases, if not all, can be explained satisfactorily by infection along the duct. In the present series there was no case of a pyæmic nature. The subject of secondary parotitis was dealt with very fully by Bucknall,[5] who published a series of convincing cases and showed by microscopic examination in fatal ones that the inflammatory changes were confined in the first place to the ducts, centres of the lobules, and the tissues around, the blood-vessels being primarily unaffected.

In these fevers, besides the lowered vitality of the patient and increased liability to septic infection, there are certain local conditions which predispose to an ascending infection of the duct. Owing to fever and a restricted diet the salivary secretion is diminished in amount. At the same time the mouth-breathing so frequent in fever patients leads to further drying of the mucous membrane. Micro-organisms then become more plentiful and virulent. Moreover, the specific bacteria of the disease have frequently been found in the oral secretions. Too much attention cannot therefore be given to the toilet of the mouth in these fevers. Constipation should be avoided and solid food should be given as soon as it is safe to do so.

Parotitis is a serious complication not only as an indication of the septic condition of the patient, and especially of his mouth, but also in itself as an inflammatory or suppurating focus which is under high tension because of the resistant fascia covering the gland. Of the 9 cases in the present series 2 were fatal. Intestinal hæmorrhage was a preceding complication in 4 of the 9 cases, and by causing anæmia of the mucous membrane and dryness of the mouth may have a contributing favour in favouring the parotid infection. It should also be remembered that the administration of morphia favours the development of parotitis.

RESPIRATORY SYSTEM.

I will not say much about the complications in the respiratory system. We had the usual cases of mild laryngitis and three cases of the severe ulcerative type which is so dangerous. (Table VIII.) A careful watch

TABLE VIII.—*Laryngeal Complications.*

Disease.	Cases.	Laryngitis.	Fatal.	Tracheotomy.	Fatal after operation.
Typhoid, inoculated	821	2	0	0	0
,, not inoculated	297	8	3	2	1
Paratyphoid A, inoculated	123	0	0	0	0
,, not inoculated	221	0	0	0	0
Paratyphoid B, inoculated	239	1	0	0	0
,, not inoculated	799	6	0	0	0
Totals	2500	17	3	2	1

has to be kept on these cases as the onset and course may be extremely insidious and the laryngeal disease may only be found at autopsy. At the first sign of either perichondritis or severe dyspnœa or stridor tracheotomy must be performed. Keen and Lüning have shown very clearly the danger of delay in these cases. Three of our typhoid cases were fatal, one man three days after tracheotomy.

My friend, Colonel Davies-Colley, performed a timely tracheotomy in a case of ulceration of the epiglottis and aryepiglottidean folds and the patient recovered. As so often happens with typhoid ulceration, laryngeal stenosis occurred and all attempts at removing the tube were unsuccessful.

Considering the frequency of lung complications in typhoid-group infection the rare occurrence of surgical conditions is rather remarkable. Two cases of lung abscess were due to extension from liver abscesses. One recovered. The other case of lung abscess resulted from broncho-pneumonia. One case of empyema was the result of extension of a liver abscess, while another, an interlobar collection, followed pneumonia and was drained with success. Pneumococci were obtained in pure culture from the pus.

JOINT COMPLICATIONS.

The joint affections (Table IX.) met with in the course of these fevers may be divided into (I.) acute arthritis, which may be (*a*) serous or (*b*) suppurative; (II.) subacute arthritis, which is of a serous type, but may go on to suppuration.

TABLE IX.—*Joint Complications.*

Disease.	Cases.	Acute serous arthritis.	Acute suppurative arthritis.	Subacute arthritis.
Typhoid, inoculated	821	1	0	1 Hip (aged 19). Onset: 36th day.
,, not inoculated	297	0	0	0 —
Paratyphoid A, inoculated	123	0	0	0 —
,, not inoculated	221	0	0	1 Both knees (aged 30). Onset: 17th and 18th days.
Paratyphoid B, inoculated	239	0	0	1 Shoulder (aged 22). Onset: 18th day.
,, not inoculated	799	2	0	1 Hip (aged 33). Onset: 24th day.
Totals	2500	3	0	4 —

Acute Arthritis.

I. (*a*) Quite early in the disease, even at the onset, one or, more often, *many* joints may be the seat of an inflammatory effusion producing a condition very like acute rheumatic arthritis and sometimes mistaken for it. In the present series there were three instances of this type of joint affection. Resolution as usual was complete. The fact that they occur early in the disease, during the stage of bacillæmia, points to these joint reactions being directly due to the specific bacteria of these fevers.

(*b*) Suppurative arthritis is a dangerous complication, and generally proves fatal. It may follow an acute serous arthritis or a subacute arthritis may become purulent, or, again, septic arthritis may be an incident in a general pyæmia or may be the result of extension of suppuration from an osteomyelitis in the neighbourhood of a joint. On the mode of origin of the septic arthritis will depend the time of its onset and also the number of joints affected.

There is abundant evidence of the pyogenic properties of the typhoid group of organisms, but as a rule suppuration in a joint is due to a mixed infection and the prognosis is correspondingly grave. Aspiration of the joint may be tried before proceeding to more radical measures, especially if the arthritis is due to a pure typhoid group infection.

Subacute Arthritis.

II. The type of arthritis in which surgical interest is chiefly centred in these fevers is the subacute form in which a serous effusion takes place quietly into one or occasionally more joints. We had four instances of this type, and they illustrate various points which are to be noticed in these cases. The large joints are affected as a rule, and the arthritis is generally monarticular, though occasionally more than one joint is involved. The onset is in the third week or later. There are more cases in the lower limb than the upper, and the hip is the joint most frequently affected. Recovery is complete as a rule, but in one case there was a tendency to stiffness, which was easily overcome.

The danger of these cases is not suppuration or stiffness, but that they may be so insidious in their onset and course as to be overlooked. The joint may gradually become distended and spontaneous dislocation takes place. Especially

does this apply in the case of the hip-joint, where large muscles mask the effusion. A careful watch must be kept on the large joints, and if a distending effusion develops the affected joint should be aspirated at once.

More and more evidence is accumulating to show that this form of arthritis is directly due to the specific bacteria of the patient's disease. In many cases on aspirating the joint no bacteria are found in the fluid, but from time to time one or other of the bacilli of the typhoid group is isolated. We have only succeeded in isolating the bacillus from one of our cases—a pure culture of *Bacillus paratyphosus B* was obtained from the fluid withdrawn from the case of arthritis of the hip. A striking point in other cases, however, was the character of the effusions which were examined by Captain A. G. Ritchie. The films were exceedingly rich in cells, which points to the effusion having been poured out to fight a bacterial invasion, and, since lymphocytes were numerous, to the invasion being a bacillary one. Probably the bacilli would be found in many more effusions if joints were aspirated early. Orloff's[6] experimental results point the same way, for after injecting joints of rabbits and dogs with cultures of *Bacillus typhosus* he found large numbers of cells in the effusions which resulted, and, in the earlier days, the *Bacillus typhosus*.

BONE COMPLICATIONS.

The *Bacillus typhosus* has been found in the bone marrow in a large proportion of fatal cases in which it has been sought for, and this tissue apparently plays an important rôle in the pathology of the disease.

Bone lesions are rare during the course of typhoid and paratyphoid fever and may be classed as sequels rather than complications as they generally occur in convalescence, or, maybe, months or even years after the patient's recovery. The commonest clinical manifestation of bone disease is an osteo-periostitis, but probably an infection of the bone marrow is the primary underlying cause in all cases. The lesion may suppurate or subside and may then recur; recurrence sometimes taking place more than once, and eventually the case may end in suppuration. The pus from these abscesses yields a pure culture of the specific organisms in a remarkable number of cases. One is forced to the conclusion that in a certain proportion of cases of the

TABLE X.—*Bone Lesions.*

Disease.	Cases		Bone lesions.
Typhoid, inoculated	821	1	20th day. Swelling on 3rd rib; subsided.
,, not inoculated ...	297	3	30th day. Inflammation over left lower rib; subsided. 21st day. Periostitis of tibia; vaccine treatment, subsided. 35th day. Periostitis of rib; subsided.
Paratyphoid A, inoculated ...	123	0	—
,, not inoculated	221	0	—
Paratyphoid B, inoculated ...	239	0	—
,, not inoculated	759	1	30th day. Abscess in connexion with 9th, costo-chondral junction; aspiration; no recurrence.
Totals	2500	5	—

typhoid group of fevers infection lingers in the bone marrow, and when some impairment of general health or a local injury provides a focus of lowered resistance this is seized on by the typhoid or paratyphoid bacilli which have been lurking in the bone marrow all the time.

It has been customary to advise radical interference by free excision of the obviously infected tissues, together with a good area surrounding, in those cases which do not subside spontaneously. It has frequently been found that if a partial operation has been done a sinus has persisted for a long time, and in many cases a pure culture of the *Bacillus typhosus* has been obtained from a sinus many months after operation.

Very extensive operations have been undertaken in cases in which the ribs have been infected, but I think other measures should be tried first. If treated by open operation an attempt may be made to close the wound by suture in pure typhoid group infections. Armstrong has suggested puncture of the abscesses and the use of passive hyperæmia, but it is to vaccine treatment, I think, we must turn to rid the body—not only this small bone area—of the persisting typhoid group infection. Secondary infection makes the case much more acute and serious, and it must then be dealt with by free incision, as recognised to be necessary in ordinary septic disease of the bone.

Three of the five cases seen at No. —— Stationary Hospital subsided spontaneously and had not recurred when the patients left France. (See Table X.) The tibial case in the course of typhoid fever did not subside at first, but when treated with vaccine great improvement took place.

In the case which occurred in the course of paratyphoid B a periostitis at the ninth costo-chondral junction went on to suppuration. Some pus was withdrawn by syringe and a pure culture of the *Bacillus paratyphosus B* was obtained. Paratyphoid vaccine was injected. On the fifty-fifth day the abscess was aspirated, and a few days afterwards there was nothing abnormal to be felt along the site of the lesion. A fortnight later the patient went to England and there was still no sign of recurrence.

These cases are very few, but the results are suggestive and make one think that aspiration of typhoid and paratyphoid bone abscesses, combined with vaccine treatment, may make the more radical operations less often necessary.

TYPHOID SPINE.

"Typhoid spine" is another sequel which may be regarded as a further instance of the special viability in the bone marrow of the typhoid group of bacilli. The lumbar and dorsi-lumbar regions are the parts of the spine most often affected, and Fraenkel found typhoid bacilli more frequently in the lumbar vertebræ than elsewhere, probably because of the larger amount of bone-marrow in them.

Typhoid spine was originally described by Gibney[7] in 1889 as a "perispondylitis," by which he meant a periostitis with inflammation of neighbouring fibrous structures, and cases reported since X ray examination has been the rule support the view that there is an organic lesion at the root of the trouble. McCrae[8] more than ten years ago demonstrated the deposit of new bone in two cases. Elkin and Halpenny[9] showed that of 72 cases reported up to the end of 1908 only 11 had been examined by X rays, but of 22 published between 1908 and 1914 X ray examination was carried out in 14, and in 11 some lesion was demonstrated.

The skiagrams show periostitis with effusion under the periosteum, changes in the intervertebral discs, and new formation of bone. Carnett[10] also published some convincing cases with X rays.

Long-continued pain in a debilitated individual may well account for exaggeration of symptoms, and in the face of the frequent demonstration of skeletal lesions it is not reasonable to attribute the symptoms entirely to neurosis.

These sequelæ of typhoid have made us realise for many years that recovery from the disease does not mean death of all the infecting organisms, and Keen insisted that a patient who had suffered from typhoid fever should only be allowed to resume the ordinary activities of life very gradually, and should be cautioned as to even slight accidents and warned against any severe physical exertion for several months after he has apparently recovered.

THE CARRIER PROBLEM.

During the last decade we have learnt to realise more and more that latent infections are not only a danger to the individual but also to the community, for in a certain number of cases bacilli are excreted from time to time either in the urine or fæces or both.

In the excretory channels chronic inflammation may be set up by the specific micro-organisms; in the biliary tract a chronic cholecystitis with or without gall-stones may result; in the urinary tract a chronic pyelitis may occur. No doubt a lesion exists in one or other excretory channel in many patients who are chronic carriers, but we have also to consider those cases in which bacilli are excreted either in the fæces or the urine for a long time after the patient is apparently cured and in which there is no sign of disease in the excretory channel concerned.

The Urinary Tract.

Taking the urinary tract first, if bacilluria is associated with pyuria it may be reasonable to regard a local condition in the urinary tract as the possible cause of the persistence of infection, but if there is no pyuria it seems to me that it is indicated to look elsewhere for some breeding-ground which from time to time discharges bacilli into the blood

stream, from which they are abstracted by the kidneys. Even with pyuria, and even if it is proved that excretion of bacteria is only taking place through one kidney, it does not follow that the typhoid condition is purely a local renal one, and it is advisable to seek elsewhere for an infecting focus. The permeability of one kidney only may be increased, and the presence of a local lesion may only be facilitating the excretion of bacilli and is not necessarily the breeding-ground of them. In Davies and Walker Hall's [11] case with five years' history bacilli were found in the blood at different times. The blood was examined during periods of bacillary excretion. Four times it was found to be sterile and twice yielded a strain of *Bacillus typhosus*. It is said that the bacilli were driven from the kidney into the circulation. It seems to me that too much attention is concentrated on the excretory channel, and that the explanation in many cases may well be that some other organ or tissue harbours the bacilli which find their way into the blood stream at intervals.

Bacilli latent in the Bone Marrow.

The question arises at once, Where is that tissue or organ? The bacilli may lurk in many places, but there are some which we know are likely harbours. We know that in the case of typhoid fever the bacilli are to be found in the bone marrow during the disease, and have been shown to be there as long as four months after recovery (Quincke [12]) without causing symptoms. We know that the bacilli may lie there, as other pathogenic bacteria are known to persist in the tissues, in a latent state without causing any disturbance. But they are always capable of doing so if the general health suffers, or some local trauma gives the bacilli the chance of getting the upper hand. Symptoms may then develop and an abscess may result as long as over seven years after convalescence (Buschke [13]).

This fact is very significant and suggestive when considered in relation to the carrier problem, for in the bone-marrow we have a tissue which is known to harbour the bacilli for long periods, and not only that, but it is amongst the parts of the body most constantly infected by them. We must, therefore, hold the bone marrow under suspicion of being concerned as a harbour for the infecting organisms in those patients who do not rid themselves of infection when they recover from the disease.

The Biliary Tract and the Spleen.

Now let us consider the biliary tract and the persistence of typhoid and paratyphoid bacilli in the gall-bladder. Again, attention has been concentrated on the excretory channel. It has been customary to look upon the gall-bladder, whether the seat of inflammation or not, as the great breeding ground of typhoid bacilli, when they have been found there at long periods after the original illness. To my mind, it seems safer to regard this tract as an excretory channel and to look further back for some other possible seat of vegetation and source of continual or repeated infection. Many of the contents of the bile, including bacteria, are simply the sediment from the hepatic filter which has turned these substances down from the blood brought to it from the gastro-intestinal tract and spleen—especially the spleen. The living organisms which get through are those which the liver has failed to kill.

Knowing the important part the spleen takes in combating typhoid and other infections by abstracting bacteria from the blood, we may for the present purpose look on the bile as the splenic effluent. We know how active the spleen is in ridding the circulation of infecting organisms, sometimes enlarging to a great size to deal with the extra task thrown on it. This function of the spleen is probably seen at its best in those cases in which a cholecystitis is the sole manifestation of typhoid, and in those in which bacilli are discharged with the bile and fæces, and the patient has never had any symptoms at all.

But we also know that this organ may become a source of continuous danger, by harbouring infective organisms, instead of ridding itself of them completely. This is well known in certain protozoal infections and is being recognised to an increasing extent with regard to other infections. Other parts of the body have been cleared of infection by stimulating the natural resisting powers by means of vaccines or by administering chemical remedies, but the spleen still persists in its bad habit. Splenectomy has been performed with success to rid the body of lingering infection in malaria (Jonnesco [14]) and in syphilis and pyogenic infection (W. J. Mayo [15]). The spleen is like a scavenger who removes refuse, and thus protects the community from many infective dangers, but who, if not scrupulously careful to attend to his own cleanliness, may become a source of danger by harbouring infective material, which he ought to have sent to the destructor. This dangerous character of the spleen seems to have been recognised in the Elizabethan era, in the literature of which period we find many apt references to this organ, for example—

> "Though I am not splenetive or rash,
> Yet have I something in me dangerous."

In typhoid and paratyphoid fever we know that organisms are found most constantly in the spleen during the attack and in some cases for a considerable time afterwards.

A man, aged 21, died at No. —— Stationary Hospital after being ill for 13 weeks and 5 days. Admitted for typhoid fever which was diagnosed by agglutination, he developed but few symptoms indicative of typhoid and soon was found to be suffering from tuberculosis also. At the post-mortem examination he was shown to have died of miliary tuberculosis, but typhoid bacilli were still present in his spleen in large numbers, though there were no other signs of typhoid about him.

Then in the case reported by Levy and Kayser [16] in 1907, a woman who was a fæcal carrier of *Bacillus typhosus* died three years after having had typhoid fever; typhoid bacilli were obtained from her gall-bladder and from inside a gall-stone, and also from her liver and spleen.

Similar cases have been described and are attributed to auto infection from the gall-bladder, but some have died without any symptoms of auto-infection, and yet typhoid bacilli have been found in the spleen.

The chain of evidence is not complete, many tissues and organs may harbour the bacilli, but the spleen is under the greatest suspicion. Surgery may not be able to help in ridding the body of infection if it is scattered through many organs and tissues, nor be able to attack the infection if localised in the bone marrow, but if localised in the spleen and splenic effluent surgical aid may yet be invoked and splenectomy be undertaken for persistent typhoid or paratyphoid infection. When pathological conditions exist in the excretory channels treatment will have to be directed to those parts, but the possibility of other seats of vegetation being responsible for the continuance of the infection must not be lost sight of, and when faced with the failure of other methods of treatment surgery may be required to rid the body of this source of danger to the individual and the community.

COMPARISON OF CASES IN INOCULATED AND UNINOCULATED.

By far the most striking point of all in this review is the remarkable difference in severity of disease, incidence of complications and mortality between the inoculated and the non-inoculated. (See Table XI.) In compiling the statistical tables I have given the widest possible interpretation to the term "inoculated" and have included as inoculated all who have had any specific vaccine at all, whether they have had a full dose or not, and also whether or not it has been administered within the time for which it is claimed that protection is conferred. It would have made the tables too elaborate to have done otherwise. Patients with paratyphoid fever who have only been inoculated against typhoid have been counted as non-inoculated.

The statistical tables are convincing enough, but the difference in severity of illness is even more striking when you are brought into actual contact with the patients, for most of the inoculated are obviously suffering from a relatively mild disease. In the unprotected the mortality was more than five times as high as in the protected. This result may well lead to a moment's reflection especially amongst those of us who have been working at Boulogne base. There, under the eyes of its originator, Sir Almroth Wright, we have seen some of the benefits of protective inoculation against those fevers—we have seen this wonderful thing in the country of the great Pasteur and within a stone's throw of France's memorial to Edward Jenner, the founder of scientific protective vaccination.

In these times of war Anstey's ode to Jenner becomes again particularly apt. Ring's translation and paraphrase runs as follows:—

> "While deathless heroes, who maintain our fame,
> And add new glories to the British name,
> Around their brows unfading laurels twine,
> The civic crown, O Jenner, shall be thine."

TABLE XI.

Disease.	Typhoid, inoculated.	Typhoid, not inoculated.	Paratyphoid A, inoculated.	Paratyphoid A, not inoculated.	Paratyphoid B, inoculated.	Paratyphoid B, not inoculated.	Totals.
CASES	821	297	123	221	239	799	2500
DEATHS	27	57	0	1	1*	17	103
MORTALITY	3·28 p.c.	19·19 p.c.	0	0·45 p.c.	0·41 p.c.	2·12 p.c.	4·12 p.c.
Hæmorrhage	10 = 1·21 p.c.	40 = 13·46 p.c.	0	1 = 0·45 p.c.	1 = 0·41 p.c.	15 = 1·87 p.c.	67 = 2·68 p.c.
Perforation	3 = 0·36 p.c.	6 = 2·02 p.c.	0	2 = 0·90 p.c.	0	3 = 0·37 p.c.	14 = 0·56 p.c.
Appendicitis	4 = 0·48 p.c	2 = 0·67 p.c.	0	0	0	5 = 0·62 p.c.	11 = 0·44 p.c.
Peritonitis	0	0	0	0	0	1 = 0·12 p.c.	1 = 0·04 p.c.
Splenic abscess	1 = 0·12 p.c.	0	0	0	0	2 = 0·25 p.c.	3 = 0·12 p.c.
Liver abscess	0	0	0	0	0	2 = 0·25 p.c.	2 = 0·08 p.c.
Suppurating mesenteric glands	1 = 0·12 p.c.	1 = 0·33 p.c.	0	0	0	1 = 0·12 p.c.	3 = 0·12 p.c.
Cholecystitis	4 = 0·48 p.c.	2 = 0·67 p.c.	0	2 = 0·90 p.c.	1 = 0·41 p.c.	6 = 0·75 p.c.	15 = 0·60 p.c.
Gall-stones	1 = 0·12 p.c.	0	0	0	0	1 = 0·12 p.c.	2 = 0·08 p.c.
Stomatitis	0	0	0	0	0	1 = 0·12 p.c.	1 = 0·04 p.c.
Noma	0	1 = 0·33 p.c.	0	0	0	0	1 = 0·04 p.c.
Tonsillitis	10 = 1·21 p.c.	4 = 1·34 p.c.	1 = 0·81 p.c.	7 = 3·16 p.c.	3 = 1·25 p.c.	12 = 1·50 p.c.	37 = 1·48 p.c.
Quinsy	1 = 0·12 p.c.	0	0	0	0	2 = 0·25 p.c.	3 = 0·12 p.c.
Deafness	1 = 0·12 p.c.	1 = 0·33 p.c.	0	2 = 0·90 p.c.	3 = 1·25 p.c.	1 = 0·12 p.c.	8 = 0·32 p.c.
Otitis media	3 = 0·36 p.c.	3 = 1·01 p.c.	0	3 = 1·35 p.c.	0	4 = 0·50 p.c.	13 = 0·52 p.c.
Parotitis	0	6 = 2·02 p.c.	0	1 = 0·45 p.c.	0	2 = 0·25 p.c.	9 = 0·36 p.c.
Laryngitis	2 = 0·24 p.c.	8 = 2·69 p.c.	0	0	1 = 0·41 p.c.	6 = 0·75 p.c.	17 = 0·68 p.c.
Lung abscess	0	0	0	0	0	3 = 0·37 p.c.	3 = 0·12 p.c.
Empyema	0	0	0	0	0	2 = 0·25 p.c.	2 = 0·08 p.c.
Venous thrombosis	7 = 0·85 p.c.	10 = 3·36 p.c.	0	2 = 0·90 p.c.	3 = 1·25 p.c.	20 = 2·50 p.c.	42 = 1·68 p.c.
Urinary	1 = 0·12 p.c.	4 = 1·34 p.c.	0	1 = 0·45 p.c.	0	12 = 1·50 p.c.	18 = 0·72 p.c.
Epididymo-orchitis	0	0	0	0	0	4 = 0·50 p.c.	4 = 0·16 p.c.
Bone lesions	1 = 0·12 p.c.	3 = 1·01 p.c.	0	0	0	1 = 0·12 p.c.	5 = 0·20 p.c.
Arthritis	2 = 0·24 p.c.	0	0	1 = 0·45 p.c.	1 = 0·41 p.c.	3 = 0·37 p.c.	7 = 0·28 p.c.
Muscle lesions	0	3 = 1·01 p.c.	0	0	0	3 = 0·37 p.c.	6 = 0·24 p.c.
Other abscesses	7 = 0·85 p.c.	5 = 1·68 p.c.	0	2 = 0·90 p.c.	0	8 = 1·00 p.c.	22 = 0·88 p.c.
Boils	3 = 0·36 p.c.	2 = 0·67 p.c.	0	0	1 = 0·41 p.c.	3 = 0·37 p.c.	9 = 0·36 p.c.
Erysipelas	0	5 = 1·68 p.c.	0	0	0	0	5 = 0·20 p.c.
Totals	62 = 7·55 p.c.	106 = 35·69 p.c.	1 = 0·81 p.c.	24 = 10·85 p.c.	14 = 5·85 p.c.	123 = 15·39 p.c.	330 = 13·20 p.c.

* This patient had lympho-sarcoma.

With regard to inoculation there is another point, which is possibly one of the most important. The specific bacteria are not found in either blood, fæces, or urine with anything like the same frequency nor in such numbers in the inoculated as in the non-inoculated, since the microbes are killed more rapidly and effectually owing to protective substances being in the body ready for the attack. It follows, therefore, that the sequels and after-effects of typhoid and paratyphoid infection must be fewer in the inoculated, and there is also less chance of infected individuals becoming "carriers" of the bacilli. Therefore not only is the inoculation of immediate and ultimate benefit to the individual and to the Army in largely preventing infection, as shown by the small incidence of cases; in controlling the disease in those who become infected and making the attack milder, complications and sequelæ less frequent, and mortality much smaller; but it will also be of lasting benefit to the community at home by diminishing the number of men who become "carriers."

CONCLUSION.

Before withdrawing from what in its preparation has been occasionally in times of stress rather an onerous task, I should like to refer to the way in which my work has been made a pleasure by the ready help and suggestions so generously given to me by my colleagues at the hospital.

When serving with the British Expedition to Belleisle, Hunter wrote home to his brother: "My fellow creatures at the hospital are a damn'd disagreeable set." No one could have written so from No. —— Stationary Hospital, where all were members of a team working together. We have been fortunate in securing the cordial assistance and coöperation of Colonel Sir Bertrand Dawson, to whom I am much indebted and very grateful for valuable help. To Colonel Andrew Fullerton I am also thankful for assistance and advice as freely given as sought. In the laboratory we have had a series of distinguished workers whose names are familiar to you owing to the contributions they have made to the bacteriological problems of typhoid and paratyphoid fever. Major G. Dreyer worked in the hospital for many months, and in charge of the laboratory we have had Colonel H. W. Grattan, Captain L. Wood, and Captain H. M. Perry, R.A.M.C., and to all of them I am indebted for help and suggestions. To all my colleagues in the wards I have incurred obligations for here a little and there a little. To Colonel C. R. Evans, D.S.O., the officer commanding, I owe a deep debt of gratitude for the way in which he has given me every possible facility; and to my friend Colonel Davies-Colley I owe a tremendous debt of thanks, for when he volunteered for service in Mesopotamia he left all his material, which he placed freely at my disposal. In fact, with so much assistance so readily given I feel "I have gathered a posie of other men's flowers, and nothing but the thread that binds them is mine own."

In working under war conditions I have not been able to refer to much material that I would otherwise have used, and perhaps I need offer no apology for the few references to the literature of the subject.

In conclusion, I wish to thank the members of the Council for the honour which they have conferred on me by electing me Hunterian professor to lecture on this important subject.

> "And here I will make an end,
> And if I have done well and as is fitting the story
> It is that which I desired; but if slenderly
> And meanly, it is that which I could attain unto."

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SERUM DISEASE AFTER INTRATHECAL INJECTIONS OF SERUM.

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THE clinical aspect of serum disease is so familiar that some apology is necessary for raising the subject again, and this perhaps may be offered in a brief comparison between its manifestations after the intrathecal and after the more usual hypodermic method of serum injection. It might naturally be anticipated that intrathecal injection would make a difference, inasmuch as any local reaction in the meninges comparable to the rash sometimes seen to start from the neighbourhood of a hypodermic injection of serum might, from the proximity of the spinal cord and brain, cause special nervous symptoms. The following statements are based on analysis of the clinical notes of cases of cerebro-spinal fever in the Royal Navy.

Meningism due to serum disease.—During the third year of the war out of 96 bacteriologically proved cases of cerebro-spinal fever treated by serums and surviving for ten days or more, 58, or 60 per cent., had a serum reaction, as judged by the appearance of a rash. Among these 58 cases there were 9, or 15·5 per cent., in which the rash was preceded or accompanied by a more or less definite recrudescence of meningitic manifestations, thus, especially when preceding the rash, suggesting a relapse of the disease. These symptoms are relieved by lumbar puncture, and under the assumption that they point to a relapse a fresh injection of serum may be given, as was done in 6 out of the 9 cases. The 3 cases not so injected recovered, and of the 6 cases injected intrathecally with serum 5 were probably made worse, 4 eventually proving fatal, though it is not suggested that death was thus induced. The effect of intrathecal injection of serum presents some peculiar features. Whereas, as is well known, injection into a healthy intrathecal space sets up an aseptic chemical meningitis, injection of anti-meningococcic serum in cerebrospinal fever—as is shown by the clearing of the cerebrospinal fluid—reduces the inflammatory process, presumably by destroying the meningococci. In discussing the injection of immune serum in acute poliomyelitis, Neal, Abramson, and others [1] point out that injection of serum into slightly inflamed meninges sets up in most cases an acute aseptic meningitis shown clinically by fever, rigidity of the neck, and other signs of meningeal irritation. It seems probable that at the time of the serotoxic meningeal reaction the meninges are slightly inflamed, and that, as this is not due to meningococci, a fresh injection of serum aggravates the symptoms and possibly does harm rather than good.

It is therefore desirable to have some means of determining whether there is a genuine relapse which will be benefited by serum or whether the condition is one of meningeal irritation or meningism and a manifestation of serum disease which may be intensified by a further injection of serum. This diagnosis can be made by examination of the cerebro-spinal fluid for the presence of meningococci, and also for the normal reducing agent (glucose) which is absent in relapses of meningitis and present in the meningism due to serum disease (Réveillet, Nové-Josserand, and Langeron [2]). This test, which takes a few minutes only, and so enables a decision to be made on the question whether to withhold or inject serum at once, has been employed by Staff-Surgeon L. Warren, R.N., and by Dr. C. Ker at the City Hospital, Edinburgh, where some naval ratings were treated.

This meningeal manifestation of serum disease is peculiar to intrathecal injection of serum, and though it occurs in a small proportion of cases should be more widely recognised in this country in view of the war-time increase of cerebro-spinal fever. It has not, however, passed unnoticed. Netter and Debré [3] in 1911 gave a good account of it, and regarded it as a result of serotoxic œdema of the meninges. It may also be added that, as the mucous membranes originally attacked by diphtheria are liable to swell at the time of the serum reaction, an analogous sequence may be suggested in the case of meningococcic infection of the meninges.

[1] Arch. Int. Med., Chicago, 1917, xx., 341.
[2] Réveillet, Nové-Josserand, et Langeron: Jour. de Physiol. et Path. Gén., Paris, 1914-15, xvi., 1080.
[3] Netter et Debré: La Méningite Cérébrospinale, p. 264, Paris, 1911.

If the meningism is part of the serum disease to be expected after intrathecal injection, the question arises why it is not noted more often. It does not appear to result from large quantities of serum given, for out of the 9 cases among the 58 naval cases with a serum reaction, 8 had less than 100 c.c., and 4 of these 8 less than 50 c.c.; nor can it be explained as due to an intrathecal injection within a very few days of the appearance of the serum rash. That it is connected with some hypersensitiveness of the meninges is probable enough, but it is impossible to go beyond this vague statement.

The frequency of serum reactions after intrathecal injections.—Flexner [4] remarks that possibly the manifestations of serum disease are more frequent after the intrathecal than after the subcutaneous injection of serum, and at first some of the figures relating to the naval cases appear to confirm this; thus, out of 61 cases of cerebro-spinal fever which received Flexner's serum intrathecally only and recovered or (if fatal) survived more than 10 days, 43, or 70 per cent., had a serum rash. Whereas out of Currie's [5] 50 cases of cerebro-spinal fever treated mainly by subcutaneous injection (36 by subcutaneous injection only, 13 by one intrathecal and the other injections subcutaneously, and 1 case by one intrathecal, one intravenous, and the remaining injections subcutaneously), 29, or 58 per cent., had rashes. The incidence of serum rashes after ordinary hypodermic injections is given by Goodall [6] from analysis of a large number of cases, as about a third, so that the percentage of 70 is in excess of Currie's and Goodall's figures. But the naval cases, besides being rather few, were all injected with Flexner's serum, which seems to be specially effective in inducing a serum reaction. Out of 241 naval cases given various brands of serum (in some instances hypodermically as well) during the first three years of the war, and surviving for ten days or more, rashes occurred in 99, or 41 per cent. This is indeed lower than the incidence (44 per cent.) of serum rashes among 37,277 cases of diphtheria treated by serum during the years 1898-1903 in the hospitals of the Metropolitan Asylums Board, and very much lower than in some other series where serum rashes were specially looked for and found in from 67 to 81 per cent. of the cases (J. D. Rolleston [7]). It does not therefore appear to be proved that the incidence of serum disease is higher after intrathecal than after the hypodermic method of injection.

Bad effects from increased intracranial pressure caused by intrathecal injection of serum are so well known and the precautions necessary to avoid this accident so well recognised that they do not require further discussion.

Intrathecal injections of serum in rare instances are followed by *secondary infections* through the wound, especially after a large number of lumbar punctures. Secondary infection may also occur through the blood-stream, and it has been thought that this may be favoured by the injection of serum. Netter and Salanier [8] refer to 22 cases of secondary pneumococcic infection of meningococcic meningitis treated by intrathecal injections of serum during the first four months of 1917, when from the increased incidence of primary pneumococcic meningitis since December, 1916, the virulence of the pneumococcus was presumably intensified. These authors suggest that the injection of serum into the subarachnoid space, especially when large quantities of serum not corresponding to the type of the meningococcus present are given, may provide a better culture medium and so favour pneumococcic infection. But since a mixed meningococcic and pneumococcic infection of the meninges may occur before lumbar puncture, as was found in a naval case, it is clear that secondary pneumococcic infection does not necessarily depend on intrathecal injection of serum. Further, the secondary pneumococcic infection would appear to depend mainly on the virulence of the pneumococcus, for in a previous series of 300 cases of meningococcic meningitis Netter and Salanier [9] found 4 cases only of secondary pneumococcic infection.

To sum up: (1) Symptoms of meningeal irritation may precede or accompany the appearance of the serum rash.

[4] Flexner: Mode of Infection, Means of Prevention, and Specific Treatment of Epidemic Meningitis, The Rockefeller Institute, N.Y., p. 42, 1917.
[5] Currie: Jour. Hyg., Cambridge, 1903, viii., 457.
[6] Goodall, E. W.: System of Medicine (Allbutt and Rolleston), 1911, ix., 113.
[7] J. D. Rolleston: Practitioner, 1905, lxxiv., 660.
[8] Netter and Salanier: Bull. et Mém. Soc. Méd. des Hôp. de Paris, 1917, 3e sér., xli., 789.
[9] Idem: Ibid., p. 394.

(2) Though serum disease is frequent after intrathecal injection of serum, especially after Flexner's antimeningitis serum, it is not clear that it is more frequent than after hypodermic injection of serum. (3) Intrathecal injection of serum necessarily involves risk of inducing increased intracranial pressure and may introduce a secondary infection; but it is not proved that the volume of serum injection favours a secondary infection of the meninges from the blood-stream.

A NOTE ON

SERUM SICKNESS IN CEREBRO-SPINAL MENINGITIS.

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THE occurrence of what appeared to be an unduly large number of serum reactions in a series of cases treated with Flexner's serum suggested that a study of these reactions, especially with relation to any effect they might have on the subsequent course of the case, might prove interesting.

Summary of Cases.

There were 60 cases in the series, but a certain number of these died before there was any probability of a reaction occurring. However, 48 patients lived nine days or over, and 36, or 76 per cent., of these suffered from serum sickness. It is quite possible that this number would have been appreciably increased had the fatal cases included in the group lived a few days longer. The reactions were, as a rule, sharp, and in most cases were accompanied by considerable fever. The outstanding feature was, as usual, the rash, which most often started as an urticaria and ran into a multiform erythema. There was much skin irritation, and those patients whose consciousness was not blunted by their original illness were much distressed by the itching. Arthritis was only noted in 6 cases, but in these was very severe, and may have been present in a milder form in some others. Adenitis of the cervical glands was very well marked in two instances. An interesting point was the occurrence in 9 cases of prodromal fever for 12 or 24 hours before any other symptoms, and, as this was occasionally accompanied by an exacerbation or relapse of the meningitic signs, it was liable to be somewhat misleading.

More than two-thirds of the reactions commenced on the eighth, ninth, or tenth days from the date of the first injection. The actual dates are given in Table I.

TABLE I.—*Showing Days on which the Rashes Commenced.*

Day from first injection.	No. of cases.	Day from first injection.	No. of cases.
6th	2	11th	2
7th	4	12th	1
8th	7	14th	1
9th	13	21st	1
10th	5		

It will be noticed that more than a third of the total reactions commenced on the ninth day. In many of the cases the symptoms lasted for several days, on an average much longer than I have been in the habit of observing in diphtheria. Thus in 19 patients the rash was troublesome for four days and over, and in 3 it lasted for fully eight days.

Aseptic Meningitis.

It is now well understood that the introduction of horse serum into the spinal canal is liable to set up a local reaction which may be described as an aseptic meningitis. Thus the clear fluid of a case, which is ultimately proved to be tubercular, may after a serum injection be found to be distinctly turbid. In two such clear fluids polymorphs and large numbers of endothelial cells were found at the next tapping, but I have no other cases in which a second puncture was made. On the other hand, in 4 cases of cerebro-spinal meningitis, in which the fluid was improving after a course of injections but was still slightly turbid, Dr. Washburn, our bacteriologist, reported "a shower of fresh polymorphs" which stained well and contrasted strongly with the disintegrated and broken-up cells of the previous day's fluid. In all these cases the serum reaction and rash followed within a few days, and it appeared that a meningeal reaction was a prodromal sign of the more usual phenomena. The possibility, then, of a fluid becoming more turbid from this cause must be remembered, and in the absence of germs it is probably wise not to take an increase in turbidity too seriously. As my attention was drawn to this point somewhat late in the series of cases, I am inclined to believe that this change in the fluid may occur more frequently than I have noted.

In only two cases have I notes of the meningeal symptoms being aggravated during the actual serum sickness. The serum reaction in one of these was interesting. The patient had had four injections on the first four days of his treatment, and was punctured again three days later. On this occasion the fluid was clear, with no micro-organisms in the direct film, although they were detected next day in the incubated fluid. He received his fifth injection and the temperature rose to 100·5° F. the same evening. He became restless and vomited. The temperature remained up next day, and in the evening the first signs of an urticarial rash appeared. On the following day he had severe headache and turbid fluid was obtained on puncture. He was again injected, but his fever continued, arthritis was present, and his headache was again severe. He was again injected next day as the symptoms continued, and the fluid on this occasion was merely opalescent. On neither of these days were diplococci detected in the smears. The rash was now very profuse, and, although the fever continued, no further punctures were thought desirable for eight days, when a clear sterile fluid was obtained. The turbidity in this case appeared to be due to the serum reaction. Another patient, who showed marked head retraction during the period of his rash, was not punctured, as the facts seemed to point against a relapse. I may add that I found that Fehling's solution was reduced by all the fluids which appeared to become more turbid as the result of a serum reaction.

Incidence of Rashes after Intrathecal Injection.—Influence of Dosage.

The great number of rashes might suggest that intrathecal injection is more liable to cause them than the subcutaneous method. I do not think, however, there is any reason to believe this to be the case. In the first place J. D. Rolleston[1] has reported from 69 per cent. to 81 per cent. of rashes following subcutaneous injection of horse serum. While I have never observed such a high percentage, it is not uncommon to find that the use of certain consignments of serum is followed by the appearance of an unusually large number of rashes, and it is generally admitted that the blood of some horses is much more irritating than that of others. I fancy that the large number of reactions following the use of this particular serum of Flexner is due to some peculiarity of the horses. Sophian has observed rashes in 60 per cent. of his cases. Our own experience of intrathecal injection at the Edinburgh City Hospital is illustrated by Table II., which shows that, while one other serum gives a percentage nearly as high as Flexner's, intrathecal injection does not invariably cause an undue amount of serum sickness.

TABLE II.—*Percentage of Rashes.*

Serum.	No. of cases.	Percentage of rashes.
Flexner (1907-08)	28	25
Burroughs Wellcome (1915)	19	26
Parke, Davis and Co. (1915)	10	40
Lister Institute (1916-17)	7	71
Flexner (1916-17)	48	75
All cases	112	50·8

My records do not show that the occurrence of the rash is much influenced by the dosage. Of four patients who did not suffer from cerebro-spinal fever, but who received a dose of serum on admission, two, or 50 per cent., had reactions. Of 11 cases of meningitis in which no reaction occurred, one received seven injections and five others as many as five, the remainder receiving a smaller amount. For some time I believed that an injection given after an interval of two or three days tended to produce an almost immediate reaction, and many of our charts strongly suggest such a view. But in the first place 18 patients, who had only a course of from

[1] Practitioner, May, 1905.

three to six daily consecutive injections and no subsequent intrathecal treatment, had rashes; and, secondly, a careful study of the charts showed that the later injections, given after an interval in the remaining cases, were very often from the eighth to the tenth day after admission—in other words, just at the period at which a rash might be expected in any case.

Effect on Course of Case.

It might naturally be asked what effect sharp attacks of serum sickness, lasting in some instances for as long as six or eight days, have in the course of the case? Personally I have been accustomed to regard them more as an advantage than otherwise. In the case of diphtheria I have for long been convinced that a smart reaction, especially when accompanied by pyrexia, is often of the greatest benefit to a patient with a poor pulse and subnormal temperature, and seems to stimulate the recuperative powers. Rolleston, in the paper above quoted, considers that the occurrence of rashes is to be regarded as a favourable prognostic sign. It is only fair, however, to admit that my own views on this question do not find general acceptance. Nevertheless I think many cerebro-spinal patients are much improved by these reactions, and in no case, when their nature was recognised, have the latter caused me anxiety. It is difficult to say to what the benefit is due, probably to some stimulation of metabolism and the processes of repair, as I take it to be the case in diphtheria. But our predecessors were accustomed to blister and counter-irritate in cases of meningitis, and presumably, in their experience, benefit, if only of a temporary kind, was obtained by this procedure. It would be difficult to devise a more thorough system of counter-irritation than is provided by most of the rashes I have seen with this particular serum, and I am prepared to believe that in cases which apparently are threatening to enter the chronic stage the improvement may be due to this cause.

One other point remains. While I personally have not persisted with injections through more than two or three serum reactions, I have not, on the other hand, observed any special ill-effects in doing so. But I understand accidents have been reported, and my present practice is not to inject in presence of a serum reaction unless the diplococci in the spinal fluid appear to be increasing. The Fehling test is a useful means of determining whether a rise of temperature, with an exacerbation of meningeal symptoms, is caused by a reaction or by a recrudescence of the disease.

EXAMINATION OF THE URINE IN CASES OF RELAPSING FEVER OCCURRING IN MACEDONIA.

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THESE investigations include the examination of the urine in 100 cases of relapsing fever, but only 89 samples were examined for the organism of the disease. The cases occurred in Macedonia and included all ranks of the Salonika Force, muleteers, and Greek labourers. In most instances lice were found in the clothes, but instances occurred in which there was complete absence of lice, and further, the skin of these men was free from suspicion. Most observers consider that lice are the carriers of this infection, others also include the bed-bug. Stitt states as follows: With the European relapsing fever bed-bugs have been suggested as transmitting agents, while Castellani gives his opinion to the effect that relapsing fever may possibly be transmitted by bed-bugs, but more probably is spread by lice.

In these investigations the spirochæta of relapsing fever was found in the urine on 27 occasions out of the 89 specimens which were especially examined for this purpose. This total is very high, and as the organism was present on some occasions in very large numbers it is possible that its presence is of importance as regards the question of infectivity of the urine. If infection can spread in this way, as is quite probable, then every possible care should be adopted to avoid carrying urine about in such a manner that a fair proportion is upset over the individual who is transporting it. It is a remarkable fact that at the present day every precaution is taken to avoid contamination of soil with normal urine, and yet abnormal and infectious urine may be transported from one end of a hospital to another, or even further, in an open glass vessel, or perhaps a paper cap may be applied, but no further precautions are adopted.

These facts are rendered even more important if we refer to the Memoranda on Medical Diseases in the Mediterranean War Area published by the War Office. Here a statement is made which will be quoted as printed: "Remember that the spirochæte has been found in the sweat and in the tears and that it has been proved capable of passing through intact mucous membrane and the unbroken skin."

The Examination of the Urine.

The urine was collected in large test-tubes, which were closed with sterile plugs fitted with care after soaking in melted paraffin. These plugs were warmed just before the tubes were required. It is necessary to mention at the outset that the urine was sent to the laboratory as soon as possible after it was collected, but as the infectious hospital is situated on the mountain side some miles from the laboratory ideal methods, so easily accomplished in England, were not possible on every occasion. Further, in many instances specimens were obtained before and after special treatment had been adopted. The samples of urine, as soon as they were received, were centrifugalised at high speed in an electric centrifuge.

The clear urine was examined for albumin and the deposit was made use of as follows: Film preparations were made on glass slides, dried at 37° C., fixed in formalin vapour for one hour, and redried at 37° C. The films were then treated by the Levaditi method for the staining of spirochætæ in the tissues and then examined in the usual way. Other film preparations were dried at 37° C., fixed in alcohol, and then stained for 20 hours by Giemsa's method, but this was not found to be as satisfactory, as the spirochætæ were very difficult to find owing to the presence in the deposit of numerous casts and cells which obscured the fields of vision. Hanging-drop preparations were made and examined with dark-ground illumination, but owing to the presence of innumerable filaments which are liable to give rise to error, and also to the bulky deposit which is present so often in these samples of urine, little reliance could be placed on this method of examination. The pyridin method was employed, but staining with nitrate of silver, as in the Levaditi process, was found to give the best results. The remainder of the urinary deposit was examined in the fresh state for casts and cells.

No cultural experiments were made, and animal inoculations, with the exception of guinea-pigs, were not possible, as monkeys, rats, and mice cannot be obtained in Macedonia for experimental purposes. Guinea-pigs inoculated with the infected urines from patients with relapsing fever did not show any ill effect, but after a period of ten days they were killed, the livers emulsified in saline, and other pigs were injected with the extracts intraperitoneally, but without effect.

The urine obtained from the cases of relapsing fever was examined at the commencement of the febrile attack, after specific treatment had been completed, and again at various intervals during the period of convalescence, because at the present time it is the custom here not to discharge patients from hospital until the urine is found to be normal.

The presence of albumin.—In the majority of the cases albumin was present, from a trace to a very obvious amount, but in some instances it could not be detected by the picric-acid or boiling test, although casts were found; usually, however, in such cases albumin was demonstrated at a later period of the disease. Once convalescence was established the urine gradually returned to the normal.

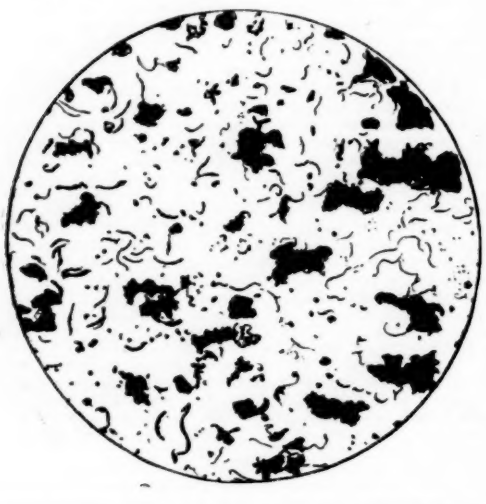
Deposit in the urine.—Every specimen of urine was centrifugalised at high speed and the deposit examined in the fresh state. Casts were usually found, especially hyaline and granular, which were often present in the deposit in very large numbers; epithelial and leucocytal casts were common, but red cell casts were comparatively uncommon. In addition to the presence of casts in the urine, red cells and leucocytes were very numerous on many occasions and also epithelial cells from the urinary tract. Uric acid crystals were abundant but generally subsequent to the acute stages or to the period of active treatment with one of the arsenical preparations.

Numerous observations were made on the condition of the urine before and after treatment with kharsivan. At the infectious hospital it is customary to give 0·25 gm. of this drug intravenously as soon as the disease is diagnosed, and in many instances distinct improvement in the condition of the urine occurred, usually gradually, but occasionally rapidly. It is important to remember that a heavy trace of

albumin and numerous casts in the urine do not contra-indicate the employment of kharsivan intravenously, otherwise such treatment could not have been employed in this series of cases. In the book published by the War Office on Medical Diseases in the Mediterranean War Area it is definitely stated that even if albumin is present this line of treatment is not contraindicated. Further improvement in the condition of the urine occurred after the injection of the drug and was maintained, and it was not uncommonly noticed that the albumin and casts diminished as soon as the kharsivan had had sufficient time to produce its effect.

Morphological Characters.—Notes of Cases.

The morphological characters of the spirochæta found in the blood in these Macedonian cases showed several coarse spiral turns and numerous figures of "8," while it had a great affinity for the ordinary stains. The long straight spiral with the faintest deviations from the straight line was uncommon. In cultures of glucose citrated broth, as employed by Clarke and myself for the cultivation of *Plasmodium falciparum*, the coarse spirals could be found in enormous numbers and had a great tendency to agglutinate and to show beading after 24 to 40 hours life outside the body. In the urine spirals with coarse turns were present and twisted elements of various shapes, while spirals with tapering extremities were common. In most instances much time was required to find the spirochætæ in the slides stained by Levaditi's method because of the extraneous matter which stained black and was present in large amount. On a few occasions spirochætæ were numerous in the preparations of the deposit as shown in the accompanying drawing



Urinary deposit from a case of relapsing fever, showing large numbers of spirochætæ. (Stained by Levaditi's method.)

In the case of an officer who contracted this disease, but who was considered to be suffering from malaria on clinical evidence, the result of the examination of the urine suggested relapsing fever before the blood was examined. The condition of the urine in this case is of sufficient interest to record in detail.

When this patient's blood was first examined his temperature was 102·8° F., and spirochætæ were demonstrated in the blood smears, while the urine contained much albumin, many red cells, epithelial cells, and numerous spirochætæ. The temperature fell to normal after kharsivan, casts disappeared from the urine, the albumin diminished, and finally disappeared. Six days from the height of the illness the temperature was normal, but spirochætæ were present in the urine, together with a certain number of epithelial cells, while a similar result was obtained eight days later, except that numerous red cells were found on this occasion. At the end of 14 days from the onset the urine became and remained normal until the examinations were completed.

It is of interest to record that in no less than five instances spirochætæ were found in the urine before they were demonstrated in the blood.

Bile pigment was absent from the urine in every case and true jaundice was not noted.

One fatal case occurred on whom I made a complete post-mortem examination.

The analysis of the urine before death showed a trace of albumin, red cells, numerous granular and hyaline casts, leucocytes, and epithelial cells. Urine taken from the bladder at the autopsy which was made a few hours after death, showed an increased amount of albumin and all possible varieties of casts, but blood casts were especially numerous. In each instance spirochætæ were found in the urine by the method of Levaditi. There was evidence of chronic inflammation and diffuse degeneration of the tubular epithelium throughout the kidneys, but especially of the convoluted tubules, while numerous casts were present in the lumina of the tubules. Smears made from the lungs in the region of the pulmonary hæmorrhages revealed numerous spirochætæ when stained with Giemsa, but none could be demonstrated in the tissues by the method of Levaditi.

I am greatly indebted to various officers of the Salonika Force for their assistance during these investigations, but especially to Lieutenant-Colonel Cross, officer in charge of the infectious hospital, for invaluable help, and to one of his officers, Captain Stewart, M.C., for every possible assistance rendered on numerous occasions. The excellent black-and-white drawing which accompanies this communication was made for me by Private Panichelli.

Addendum.

Since this communication was sent to THE LANCET two important papers have quite recently appeared in the *British Medical Journal*.

Lieutenant Stoddard[5] considers from his personal experience that (1) spirochætæ are not uncommon in the male urethra without signs of relapsing fever; (2) that many varieties are met with; (3) that spirochætæ are a source of contamination in uncatheterised urines. He examined 100 men, of whom 50 included cases of all kinds and 50 men from U.S.A. who were in excellent health, while none of the series had ever suffered from "relapsing fever," or more correctly fever of a relapsing type, in his opinion. As a result of these observations 46 per cent. of urethral films showed spirochætæ, while if the *refringens* type is included it amounted to 56 per cent in series (1), while in series (2) 20 per cent. were found, or 22 per cent. if we include the *refringens* form. Lieutenant Stoddard ascribes the difference in the results which he obtained to a question of health, as the sick men will give a higher percentage of spirochætæ in the urethra than the U.S.A. men who were so fit. In a large percentage of his cases spirochætæ were numerous in the film preparations of the urethra.

Major Patterson[6] records his observations on the examination of the urine for spirochætæ which are not exactly in agreement with the results or conclusions as given by Lieutenant Stoddard. These observations are based on the examination of the urine in certain clinical types of P.U.O., and he found that: (1) Spirochætæ occur in the urine in cases of trench nephritis; (2) abdominal types of P.U.O.; (3) relapsing types of P.U.O. (trench fever). The spirochætæ which he found in the urine were very resistant to staining, as they were uncoloured by Leishman, Romanowsky, and Giemsa, and required a mordant, while they were found in the urine often abundantly after the rise of temperature.

My own observations are based on the examination of cases of European relapsing fever in Macedonia, and not with cases of fever which on clinical evidence are said to have "relapsed," as this group is considerable and would include the majority of diseases as met with in the Balkans. The spirochæta of relapsing fever, as met with here, when examined in the fresh state by dark-ground illuminations, preserves a perfect corkscrew shape, while similar material fixed and stained with Giemsa will show, in addition to the typical corkscrew spirochætæ, many others in which the corkscrew appearance is more or less lost or most irregular. This distinction between the morphological characteristics of the spirochæta in the fresh state and the preparation stained with Giemsa is still further exaggerated when a comparison is made with the Giemsa stained preparation from urine and those made with Levaditi. In my opinion the morphological appearances are very dissimilar under these varying conditions.

If we next refer to the high percentage of positive findings obtained by Lieutenant Stoddard in his first series among men of whom it was possible to exclude any form of "relapsing fever," it is at once apparent that his results show a much greater percentage of positive findings than in my series, in spite of the fact that the Balkan cases were suffering from true relapsing fever. Further, the majority of these cases had albumin, or red cells, or casts which were often abundant in the urine, with the spirochætæ. The low condition of health would be a common factor in each series. It is, however, the appearance in the urine of albumin, red cells, and casts which is so important in the urine of true relapsing fever, and serves as an explanation for the presence of the spirochætæ in the urine. The

findings of Lieutenant Stoddard, however, are extremely important, especially as we are in the "spirochætal period of medicine" at the present time. A catheter was never employed in my cases, because I consider that warm urine is the best flush for the urethra, and have long discarded catheters, as in my opinion passing "rods" along the urethra is not to be recommended for bacteriological purposes except when circumstances especially demand it.

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"COLLOSOL" COCAINE.

BY G. BARGER, M.A., D.Sc., H. H. DALE, M.D., F.R.S.,
AND
FLORENCE M. DURHAM.

(*From the Department of Biochemistry and Pharmacology, Medical Research Committee.*)

IN April and May of this year statements were published in THE LANCET (April 28th and May 19th) and *British Medical Journal* (May 5th and 19th) which embodied preliminary reports on the above preparation of cocaine by Professor R. Tanner Hewlett, Professor W. J. Simpson, and by Dr. John Eyre.

It was claimed that cocaine in this form retained its local anæsthetic action, but had lost its general toxicity; and the observations described in the reports seemed to afford justification for such a conclusion. If the statement could be accepted, it would obviously have not only practical importance but theoretical interest of a very high order. It did not appear to us to have any obvious relation with the colloidal condition of the alkaloid, which was put forward by the manufacturers in explanation of the anomaly. We decided to investigate the matter further, but our observations have failed to confirm the existence of the suggested disparity between toxicity and anæsthetic power. In the samples which we examined the toxicity was, indeed, much lower than that of an ordinary 1 per cent. solution of a cocaine salt; but the local anæsthetic action was low to a corresponding degree, and both actions corresponded satisfactorily with the proportion of cocaine chemically recoverable from the solution.

It seems desirable to publish our results, in view of the publicity given to the earlier observations. We believe that we can indicate some sources of error in these, and the exposure of a trap in which experienced observers seem to have been caught may always have value for others. We wish to make it clear, however, that we have no reason whatever to doubt the bona fides of the manufacturers, who have withdrawn "collosol" cocaine from their list on hearing from us of our conclusions. Our criticism is concerned with "collosol" cocaine alone among their preparations, though less easily tested claims, made on behalf of other "collosol" alkaloids, should, in our opinion, lose what indirect support they seemed to receive from the earlier observations on "collosol" cocaine. The allegation that a substance is presented in colloidal solution should not be regarded as sufficient ground for a claim that it possesses properties otherwise mysterious or incredible.

On consideration of the earlier reports and of the information given to us by the makers, it appeared that several points required further investigation.

1. The local anæsthetic action should be determined in a more quantitative manner. The degree of anæsthesia produced in the rabbit's eye by a given solution of cocaine varies widely in different animals. We compared the various samples of "collosol" cocaine with solutions of cocaine hydrochloride of known strength, making each comparison by instilling equal quantities of solution into opposite eyes of the same rabbit or into the same eye with a sufficient interval for complete recovery. The test stimulus was kept uniform and the duration of the different degrees of anæsthesia recorded in each case. In this way we were able to recognise that none of the five samples examined approached a 1 per cent. solution of cocaine (as hydrochloride) in anæsthetic action. Three of them had an action nearly equivalent to that of 0·25 per cent. cocaine, the other two had a much weaker action, so weak that a concomitant irritating effect, presumably due to other constituents, made it impossible to match the activity with that of a pure cocaine solution.

2. The toxicity of cocaine given by intravenous injection varies very widely with the rate at which it is introduced into the circulation. If a solution which is supposed to contain 1 per cent. of cocaine, but in reality contains much less, is injected at the same rate as a standard 1 per cent. solution, the real discrepancy between the toxicities will be very greatly exaggerated. For comparison of toxicities of cocaine solutions by this method all injections must be made at the greatest rate compatible with the avoidance of injury to the heart by mere volume effects.

We chose for tests of toxicity the three samples of which the anæsthetic action corresponded to that of 0·25 per cent. cocaine. One was tested by hypodermic injection into mice, the second by intravenous injection into rabbits, and the third by both methods. Material was not available for very exact determinations, but in every case the lethal dose of the "collosol" sample was four times that of a 1 per cent. solution of cocaine, within the limits of accuracy set by the nature of the test and the number of experiments possible. Two of the preparations appeared to contain some substance which depressed the tremors and convulsions seen with non-fatal doses of pure cocaine, but this action did not appear to raise the lethal dose.

3. The same three samples were examined chemically, the solution being made alkaline with ammonia and shaken with successive quantities of ether. The washed ethereal extracts were united and evaporated and the residue of cocaine weighed. From one sample the cocaine was obtained pure and crystalline, with the correct melting point. The residues from the other two contained traces of non-crystalline material, but had the physiological action of pure cocaine. In each case the quantity of cocaine obtained was approximately 24 milligrammes per 10 c.c. of solution—i.e., 0·24 per cent.

4. Part of one sample was filtered through a wet collodion membrane under a pressure of about 25 cm. of mercury. The colouring matter in the solution was held back by the membrane, the filtrate being quite colourless. The cocaine was extracted from the filtrate and weighed, the quantity found being 23 milligrammes per 10 c.c., or 0·23 per cent. Allowing for the wetness of the membrane, it may be said that the cocaine passes quantitatively through it. The cocaine which is present is, therefore, in the form of an ordinary salt, and is not in colloidal solution.

Conclusions.

1. The local anæsthetic action of three samples of "collosol" cocaine corresponded roughly with that of a 0·25 per cent. solution of pure cocaine. In two other samples it was much lower.

2. The toxicity of the three better samples was about one quarter of that of 1 per cent. cocaine.

3. The quantity of cocaine chemically recoverable from each of the same three samples was approximately 0·24 per cent. instead of 1 per cent. as indicated.

4. The cocaine which was present passed freely through a collodion membrane, and was therefore not in colloidal solution.

DONATIONS AND BEQUESTS.—Aberdeen University will benefit to the extent of some £12,000 under the will of Dr. Archibald Carmichael, formerly of Barrow-in-Furness, and latterly resident in Perth, who died on Feb. 22nd, 1916, bequeathing to the University the residue of his estate, subject to certain life-rents, with the instruction that the income thereof should be applied "for the advancement of the work of the medical side of the University in such manner and subject to such regulations as the Senatus Academicus of the same University may from time to time determine and think fit." Dr. Carmichael was a native of Mary Culter and a graduate in arts and in medicine of Aberdeen University.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

Manifestations of Serum Disease which may Follow Intrathecal Injections.

A MEETING of this section was held on Nov. 27th, Surgeon-General H. D. ROLLESTON, R.N., the Vice-President, being in the chair, when short papers were read on the Manifestations of Serum Disease which may Follow Intrathecal Injections. Surgeon-General ROLLESTON'S paper appears in full on p. 821 and Dr. CLAUDE KER'S on p. 822.

Lieutenant-Colonel E. W. GOODALL said that prodromal fever had been noticed after the subcutaneous injection of serum. Fever did occur without a rash and one manifestation might be a temperature without irruption. The proportion of rashes varied with the serum used. No doubt, if the patients who died during the latent period were excluded, 40 per cent. of the remainder would have had rashes. The severity of serum sickness was not nearly as bad as when serum was first introduced.

Dr. J. D. ROLLESTON thought that the severity of the rashes was determined by the size of the dose and varied indirectly to the severity of the attack.

Major C. R. BOX drew attention to the absence of rashes when precipitated antitoxin was used. Numbers of men in the Army had been injected with tetanus antitoxin, and might get cerebro-spinal fever later. What was the likelihood of their getting anaphylaxis? He thought that the percentage of rashes might be linked up with the amount of foreign protein given. Figures from two General Hospitals showed that the rashes only amounted to frem 2 per cent. to 5 per cent. of the cases injected, and might be due to the small amount of protein administered as the unitage was high.

Lieutenant-Colonel GOODALL said that the strength of unitage had gone up, but the volume to be injected had gone up also. Many soldiers had frequent injections of antitoxin, but the number who got anaphylaxis was very small.

Dr. R. A. O'BRIAN also spoke, and Surgeon-General ROLLESTON briefly replied.

SECTION OF OTOLOGY.

Exhibition of Cases and Specimens.—Gastro-intestinal Sepsis a Cause of Ménière's Symptoms.

A MEETING of this section was held on Nov. 16th, Dr. H. J. BANKS DAVIS, the President, being in the chair.

On the proposition of Mr. HERBERT TILLEY, seconded by Dr. WILLIAM HILL, a cordial vote of thanks was accorded to Mr. H. J. MARRIAGE, the retiring President.

The new PRESIDENT, in the course of an address, reminded members of the section, who were all specialists, that its proceedings were widely read by medical men who might not have the same opportunities as they themselves had for acquiring a special knowledge of otology. He said that because there was a tendency to report upon and exhibit at these meetings only cases of rare or special interest which might exclude much information concerning types of cases commonly met with. The experience of all was worth recording, though everybody's opinions might not be. He regarded it as a duty of the section to promote knowledge among the general body of the profession. The subject of special debate for the winter would be "The Influence of Abnormalities and Diseases of the Nose on the Ear," a topic which had an important bearing on aviation, as flying men with nasal obstruction were liable to be handicapped by disturbances of equilibration when flying. In a minor degree this applied also to gunners in the naval and military services. Other aspects of the specialty calling for further investigation included the best after-treatment following operations on the mastoid, the best treatment for shortening the duration of Eustachian catarrh with simple catarrhal otitis media (a common condition during the war), the alleviation of the symptoms of otosclerosis, how these can be distinguished from those of chronic adhesive catarrh, and tinnitus, "the bugbear of otology."

The PRESIDENT showed a green pea which he had extracted from the middle ear of a boy aged 10 years. Examination of the ear in the casualty department revealed nothing, but as facial paralysis supervened the patient was admitted into the hospital, and Dr. Davis, by the post-aural operation, extracted the pea, with husk complete, which had swollen to the size of a hazel nut.

Mr. E. D. D. DAVIS showed a case of war injury to the ear, due to a shell wound of the left malar region, which also destroyed the sight of the left eye. Granulation tissue was present in the left external auditory meatus and a healing perforation of the posterior inferior quadrant of the drum. The loss of hearing was considerable and likely to be permanent. He did not think the deafness was functional.—Dr. PERRY GOLDSMITH considered there was a functional element in the case, as he could not understand why a wound in the position mentioned should have destroyed the man's drum.

Mr. SOMERVILLE HASTINGS showed a case of cholesteatoma which exposed the lateral sinus. The patient, a woman aged 33, seen last July, gave a history of chronic discharge from the right ear for eight years, and pain in this ear during the last few weeks. She had never had an operation on the ears. The right ear was filled with pus and epithelial débris, and removal of this disclosed a large smooth-walled cavity, all trace of the membrana tympani and ossicles being lost. The lateral sinus was exposed for half an inch and could be seen pulsating. Hearing in this ear was very defective. There was no need to operate here, as Nature had operated.—Dr. HILL drew attention to the fact that sometimes the lateral sinus was situated in a forward position, a possibility which surgeons should have in mind during ear operations.—The case was fully discussed.

Mr. W. M. MOLLISON showed a man, aged 21 years, with complete deafness and almost complete loss of labyrinth function.—Mr. J. F. O'MALLEY, suspecting the case to be functional, detailed the plan which he had successfully followed in detecting and curing such conditions.—Mr. SYDNEY SCOTT mentioned the means carried out at the National Hospital for the Paralysed with the same object.

Major E. B. WAGGETT sent a short contribution on a case of Myasis of the Ear. It was due to the flesh-fly, *Sarcophaga carnaria*, specimens of which accompanied the paper.

Mr. T. MARK HOVELL read a paper on Gastro-intestinal Sepsis a cause of Ménière's Symptoms. He said that outside the ranks of otologists there was a tendency for patients suffering from the group of symptoms which Ménière described to be regarded as having incurable ear disease. The paper dealt only with cases in which patients had middle-ear disease and in whom the reason of the symptoms was not apparent. Many of the patients benefited had the following conditions present when first seen: furred tongue, congested pharynx, naso-pharyngeal catarrh, hypertrophic rhinitis, flatulence, frequently considerable distension, constipation. The blood pressure was usually high, sometimes the heart was dilated, and the Eustachian tubes were in most cases closed. Considering the high blood pressure, the presence of tinnitus and giddiness was not to be wondered at. He had directed his attention to remedying the gastro-intestinal condition, to obtaining specimens of stomach contents during fasting, and the preparation therefrom of a vaccine as adjuncts to treatment. No measures for reducing blood pressure would succeed unless the intestinal tract were restored to a healthy condition, towards which the giving of full doses of castor oil was a great help. Locally, the injection of air into the tympanum lessened the Eustachian distress, but for permanently restoring the patency of those tubes the best measure he knew was the injection into them through a catheter of a few drops of collosol argentum, which should reach the tube in the form of a spray. To lessen the naso-pharyngeal catarrh, collosol argentum, or collosol iodine was useful, sprayed directly backwards through the nostril. The first of these remedies he had also found useful for relieving earache. Collosol preparations should not be given in conjunction with arsenic, as poisoning might ensue.—The paper was discussed at length.

The report of the Committee of Otological Research was presented to the meeting, and the members of the committee—Mr. Marriage, Mr. E. D. D. Davis, Mr. Somerville Hastings, Dr. Fraser, Dr. A. Gray, Mr. Hugh Jones, Sir William Milligan, and Mr. Sydney Scott—were cordially thanked for their labours.

MEDICAL SOCIETY OF LONDON.

Resumed Discussion on the Value and Limitations of Sanatorium Treatment for Tuberculosis.

A MEETING of this society was held on Nov. 26th, Sir STCLAIR THOMSON, the President, being in the chair, when the discussion on the above subject was resumed.

Dr. W. CAMAC WILKINSON said he thought sanatoria indispensable in the treatment of certain forms of tuberculosis, but the present system could not touch the fringe of the disease, for in those classes who could not pay for their own treatment, including, after the war, soldiers and dependents, there would be 300,000 victims. There were 11,000 beds in sanatoria, and all authorities now admitted that each case needed, on an average, six months' residence. Thus there would be room for 20,000 every year. This meant that 6 6 per cent. of these victims could have treatment in one year and 50 per cent. of these were dead in 3 to 4 years, so that benefit was chiefly limited to 3 3 per cent. of the total. Thus, 93·3 per cent. of the cases needing treatment could not enter a sanatorium for at least a year. In other words, 20,000 cases are treated and 280,000 are left out, and the problem should not be discussed as affecting only a small portion of the victims. The pecuniary loss to the nation from prolonged residence in sanatoria was, he said, from £2,500,000 to £4,500,000 every year. The alternative scheme which he advocated was in full working order in Sydney, and tables showed the efficacy and economy. Every remedy which could increase the value of sanatorium measures or diminish their limitations should be discussed, and he knew of none which yielded such satisfactory results as the specific remedy called tuberculin, but it must be used according to the approved method which had secured these results.

Dr. G. A. CRACE-CALVERT thought that statistics suffered because the patients who had gained permanent benefit did not report again to the sanatorium, and that sanatorium treatment should be given before home treatment. Sanatoria were of value because a patient came under the care of a physician who could advise him on all conditions of his life, which he could be taught to regulate, while the moral and educational effects were useful. The majority obtained quiescence of the disease, which might go on to arrest. The unsuitable cases were the acute, auto inoculations, alcoholics, and patients of the flabby type. Three months was the least which should be spent in a sanatorium, and he advocated the starting of colonies along the lines of the Cambridge After-Care Colony.[1]

Dr. HENRY ELLIS said that sanatoria, from a national point of view, were a failure; the number of beds was increased to 11,000 without a drop in the death-rate; but from the point of view of the individual they were of enormous value. Sanatorium figures were very unsatisfactory, as they were limited to cases showing tubercle bacilli in the sputum, cases not being counted until there was tissue destruction. Sanatoria were most valuable in early cases, least valuable in bad cases. There should be separate sanatoria for each class. Lighter treatment was required along the lines of the convalescent home, for even a short time away from work would improve enormously the condition of the tuberculous. Australian figures showed that the mortality among the independent classes was greater than among the working classes. In this country more than 50 per cent. of patients died within six months of notification. We were not scientific where tuberculosis was concerned, he pointed out, for while we knew that sanatorium treatment was good for early tuberculosis and we eliminated early tuberculosis from our statistics; we knew that delay in sanatorium treatment was fatal to success, yet we had waiting lists; we knew that a man's environment, by lowering his resistance, produced the disease, but we did nothing to make his environment better; we knew that early recognition was the keystone of success, but were we doing anything to investigate how early recognition might be made more simple and certain?

Dr. JANE WALKER thought that the results of sanatorium treatment were disappointing if regarded solely from the physical point of view, but the social and educational factor was of great value. A poor patient for the first time in his life had time to learn how to think and live and use his leisure time. The treatment of tuberculosis in children was very important. Infection occurred at a very early age, previous history could be obtained more easily, and tuberculous children were much more intelligent than others. Boarding schools for working-class children were urgently required, especially when these children were delicate. Working-class patients should return to their previous work, as in this way much of their anxiety was relieved. Means for treatment of surgical tuberculosis in adults was much needed.

Dr. HECTOR MACKENZIE said that it was impossible to decide whether any particular case of consumption was curable or not. The sanatorium was only one means for attacking the problem and was designed for hopeful cases, but there was need for permanent institutions for the incurable advanced cases and for the dying.

Dr. A. NEVIN ROBERTSON said that the sanatorium was the best method of raising resistance which we had at present. The limitations were financial, patients not having enough money to get treatment for a sufficient length of time. Of 1141 patients who had been in Benenden Sanatorium from 1907 to 1914, 36 per cent. were on full work, 3 per cent. on partial work, 11 per cent. on no work, 41 per cent. were dead, and 6 per cent. were readmitted. Of 563 cases traced at the end of 1914 who had left in the years 1907–11, 20 per cent. were on full work, 2 per cent. on partial work, 2 per cent. on no work, 63 per cent. were dead, and 12 per cent. had been readmitted. He thought the results in early cases were often permanent. Bad housing was only one factor in causing lowered resistance, which followed alcoholism, syphilis, overwork, dissipation, poverty, and lack of food. The *value* of sanatorium treatment depended upon discipline and healthy environment. For the prevention of the disease we must have thorough education of the people in the laws of health, and remove the conditions of bad environment. Early diagnosis and treatment and isolation of infective cases from beginning to end of the disease were required.

Dr. D. J. CHOWRY-MUTHU said that we must decide whether tuberculosis was a social or infectious disease. If it were an infectious disease every measure of inoculation and injection and internal administration of antiseptics would be legitimate and essential. But while believing in infection we could not consistently swing round and attack poverty, alcohol, bad housing, low wages, and other social evils. He was convinced that consumption was more a product of vicious environment than of infection. From a study of the mortality rate of phthisis in England and Wales for 40 years from 1875 to 1915 it happened that during the last 20 years (1895 to 1915), in spite of active propaganda and great efforts to destroy infection, the rate of mortality had not declined so much as in the previous 20 years when no such efforts were made. On the other hand, the fact that improved well-being of the people had been the means of reducing the mortality of phthisis was a proof that it was more a social and economic disease. The success of sanatorium treatment supported this, for the provision of fresh air, food and rest, and healthy environment had brought about cure or arrest in many cases. Its value depended among other things upon the nature of cases admitted, the duration of their stay, the discipline among the patients, and the personality of the physician. But sanatorium treatment could not prevent tuberculosis or cure every case. It was the first link and showed the patient how to live the right life. It was for the nation to devise larger and more comprehensive measures, such as farm colonies, industrial settlements, garden cities, &c., to meet the needs of both the disabled soldier and the disabled consumptive.

Dr. JOHN SORLEY thought that undue importance was attached to physical signs in classification. Early cases only were to be sent to sanatoria, but he had patients with cavities doing 70 hours per week, and patients with the disease in an early stage with a few crepitations at an apex going down hill quickly. The death-rate of those who did not avail themselves of sanatorium treatment was 84 per cent. higher than among those who did.

Lord GLENCONNER, President of the National Association for the Prevention of Consumption, said that much progress had been made, not in cure but in investigation, and in care in providing healthy surroundings for our working people. He was favourably impressed by all he had seen in sanatoria. Only the fringe of the problem was touched, but in time to come that margin would become larger.

[1] See THE LANCET, Nov. 24th, p. 779.

Reviews and Notices of Books.

Lord Lister. By Sir RICKMAN JOHN GODLEE, Bart., K.C.V.O. London: Macmillan and Co. 1917. Pp. 676. Price 18*s.* net.

"A SCIENTIST'S public life lies in the work that is his" were Lister's own words in regard to the form in which posterity should think of him. And of no one could this be more truly said than of him who made modern surgery possible, who—in Professor Howard Marsh's words as Bradshaw lecturer—opened the gates of mercy on mankind. Lister's life is therefore written, from his own point of view, in the two stately volumes of Collected Papers published in 1908 by the Clarendon Press, as well as in the work of every surgeon who practises the antiseptic methods which Lister introduced. But it was, nevertheless, inevitable that a generation which no longer knows Lister in the flesh should desire some personal details of a radiant career, and the medical profession as well as a wider public owes Sir Rickman Godlee a debt of gratitude in having provided them with an authoritative biography. As Lister's nephew, who was intimately associated with him in his surgical and experimental work, Sir Rickman Godlee claims certain disabilities as a biographer, but the reader will not be inclined to admit the drawbacks, and will have no difficulty in forming his own judgment in places where the biographer modestly leaves facts to speak for themselves.

Sir Rickman Godlee's account makes it easy now to picture the qualities which enabled Lister to present his message to the world with success. Brought up in a Quaker household, and debarred from entering either of the older Universities, his youth was spent in the practical pursuit of natural history on long country walks, in reading Latin authors with his father, himself a man of no small scientific and artistic attainment, who brought up his family in the conviction that life was a gift to be employed for the honour of God and the benefit of one's neighbour. The microscope which helped to confirm Lister's arduous experimental work was itself improved in several important particulars by his father's optical studies. Lister therefore received his education in a scientific atmosphere of a nature which fitted him for independent thought. He possessed, too, those personal qualities of mind which added force to his teaching: his serenity was absolute, his courtesy unfailing, coupled with a persistence which was neither discouraged by others' neglect of his work nor unduly elated by their notice of it. When he had no other adherents he was happy in the ability to convince his own pupils of the justice of his conclusions. Lister had, too, in a remarkable degree, the courage of his convictions. He trusted his own antiseptic methods and based his practice upon them. At a time when Sir Rickman Godlee was demonstrating in anatomy at University College and expressly forbidden in consequence to enter the surgical wards of the hospital, Lister constantly employed him to assist in operations in his private practice. Qualities such as these enable a man to live down the early opposition which novel and original thought stirs up. Semmelweis, too, showed how infection from the dissecting-room could be met. He observed that the mortality in the Vienna Maternity stood at a greatly higher figure in the wards attended by students than where midwives were employed. The use of chlorinated lime to cleanse the students' hands as they came from the dissecting-room to the women's clinic at once reduced this mortality from 12 to 3 per cent. But Semmelweis found himself unable to impress his views on his own colleagues; his energies were wasted in eternal wrangling, and after years of ridicule and persecution his mind finally became unhinged. Lister, when he visited Budapest in 1885, found that Semmelweis had been forgotten in his own native city.

Besides the picture of Lister himself, Sir Rickman Godlee's book contains an attractive sketch of Victorian medicine at Edinburgh, at Glasgow, and in London. Lister's relations are drawn with such foreign savants as Kölliker and Pasteur. The latter, whom he had long recognised as having furnished the principles upon which alone the antiseptic system could be carried out, he did not actually meet until the year 1881. The scene is graphically described in which, ten years later at the Sorbonne, Lister delivered an oration at the great gathering called to honour the illustrious Frenchman in whose steps he had followed. M. Rixens's picture of the scene is well reproduced, and a number of excellent portraits of Lister and of his near relatives are given. The book is indeed all that a biography should be, and is certain of a great success.

War-shock: the Psychoneuroses in War; Psychology and Treatment. By M. D. EDER, M.R.C.S., L.R.C.P. Lond., B.Sc., late Temporary Captain, R.A.M.C. London: William Heinemann. 1917. Pp. 154. Price 5*s.* net.

THE author was in Malta for many months and has recorded in this book the first hundred consecutive cases of psychoneurosis which came under his care there. From the nature of the circumstances in which he was placed he has been unable to follow up the majority of these cases, so that the reader is not provided with the ultimate result. As far as immediate results are concerned, however, Mr. Eder claims that he obtained "complete cessation of all the symptoms" by "suggestion under hypnotism," and this he calls a "cure." According to his figures the percentage of "cures" thus obtained was most gratifying, and Mr. Eder may be congratulated on the excellence of his results.

Mr. Eder avows himself a follower of Freud and adopts his classification of conversion-hysteria and anxiety-hysteria. He does not use the term neurasthenia, for the reason that he is "unable to find, at any rate in the troubles produced in the war, any clinical entity that corresponds to this term." Neurasthenia has not infrequently suffered dismemberment before this, but as far as we are aware it has never been pruned away to nothing, and we can only suppose Mr. Eder's experience to be unusual. We should add, in fairness, that Mr. Eder regards neurasthenia as the clinical picture, as his master Freud declares, "corresponding to the specific cause of excessive masturbation or frequent pollutions." If this is what the Freudian understands by neurasthenia, it is perhaps not surprising that in the midst of modern warfare Mr. Eder has not come across the condition. In other ways the reader will find material for discussion in these pages, which run along well-marked Freudian lines.

Occasionally in Freudian literature we get the impression of a certain slight air of condescension on the part of the enthusiast in referring to other methods of treatment than his own. While Mr. Eder regards suggestion under hypnotism as the method of election for war-shock in the soldier, he allows himself to say that electrotherapy, massage, and Weir-Mitchell treatment have a "savour of charlatanism." He cannot, however, be ignorant of the fact that results as good as, or even better than, his own have been obtained by the methods he thus alludes to, and this, too, in many instances where hypnotism has failed. He probably knows that, according to the latest opinion of French observers, in exactly the same class of case as has come under his care, "suggestion under hypnotism should be definitely abandoned." The categorical statement is made by Mr. Eder that "the faradic current should not be used in the hysterical mutism of soldiers." Those who have employed it with success in cases that have been hypnotised without result will probably smile at Mr. Eder's veto. In his introductory chapter Mr. Eder refers to "reflex paralysis" as a "new disease" which Oppenheim has described (we owe it, however, to Babinski), and says this new disease "seems but due to his (Oppenheim's) ignorance of contemporary psycho-pathological work." Unfortunately the statement seems but due to Mr. Eder's ignorance of contemporary neurological work.

Encyclopædia Medica. Second edition. Vol. V.: Filix Mas to Heart. London and Edinburgh: W. Green and Son, Limited. 1917. Pp. 766. Price 20*s.* net.

THIS instalment of the great work which Dr. J. W. Ballantyne is editing keeps up the standard of the previous volumes. All the articles which have appeared before have been revised or rewritten, and new articles appear on First Aid, by Dr. H. L. Watson Wemyss; on the Development, Anatomy, and Physiology of the Fœtus, and on Diagnosis in Gynæcology, by the editor; and on Graphic Methods in Examination of the Heart, by Dr. G. Douglas Mathewson. The whole section on the heart occupies 200 pages, and forms an up-to-date summary of cardiac medicine and surgery. There are a few useful coloured plates and a number of illustrations in the text.

THE LANCET.

LONDON: SATURDAY, DECEMBER 1, 1917.

The Numerical Position of the Medical Student.

To the General Council of Medical Education and Registration, which commenced its winter sitting on Tuesday last, Sir DONALD MACALISTER, the President, in the course of his address from the chair, made a valuable pronouncement with regard to the numerical position of the medical student. It is, of course, well known that the loss to the medical schools of students who had necessarily joined the Navy and Army deprived the country of men who would in other circumstances have been added to the Medical Register as new practitioners, especially during next year and 1919. We have frequently pointed out that much difference of opinion was manifested at the commencement of the war as to the advisability of using medical students for combatant service, but optimism dictated a policy which, whatever we may think now, had its origin in sound and patriotic reasons. While everybody could see that if all the potential medical men in the country went on combatant service there would sooner or later be a shortage of practitioners, few believed that the effects of the shortage would actually be felt during the war, seeing that few put the duration of hostilities at a longer period than, say, three years. On the other hand, all who thought about the matter at all—and, unfortunately, they were not many in number, even of the medical profession—felt that even a war of two years' duration, if it shut off all recruits from the medical profession, would have an evil outcome. As the medical profession is wanted with equal urgency for civilian and military purposes, and as no medical curriculum can occupy less than five or six years, it was seen by the more provident that while hostilities continued we should get nearer the point when there would be a dangerous diminution in the ranks of medical practitioners.

Sir DONALD MACALISTER, in putting the situation before the highest authorities, has been able to support his words with statistics; and the figures, as he announced them to the General Medical Council, show that in January, 1917, only 572 men and 261 women were in the third year of their medical studies, and could therefore be counted upon as probable accessions to the Medical Register of 1919. This would mean a shortage from the normal of nearly 300 practitioners. The Army Council, on the position being made known to them, directed that students registered prior to August 1st, 1914, who had before enlistment completed two years of the curriculum—i.e., who were students in their third year at least—should be passed out of combatant service to resume medical study. In order to determine the effect of this concession, as well as to dictate further policy, the Minister of National Service has since asked for a census of medical students actually in attendance at the opening of the present session. Accordingly, in October forms were sent out by the Registrar of the General Medical Council to be returned on Nov. 14th, and the figures, so far as they go, are those given to the Council by the President (see page 834). The figures, it will be seen, show that students in their first and second years were largely under 18 years of age in October, 1917. They were accordingly outside the influence of conscription for combatant service; and this fact, of course, is not without significance. Students in their third year in October, 1917, had increased in number, suggesting that the Instruction of the Army Council, quoted above, has had some effect, but the proportionate increase among female students is far larger than it is among male students. Fourth-year male students numbered 709 and females 194, upon which figures Sir DONALD MACALISTER comments with the simple statement that unless all students of this standing are returned from military duties, the supply of new qualified men cannot be maintained in 1919. As, however, the Ministry of National Service has agreed to maintain, if possible, the supply of medical students at a level which should ensure the annual addition of at least 1000 medical practitioners to the Register, it will be necessary to modify the scope of the existing Instruction of the Army Council. Without such modification Sir AUCKLAND GEDDES'S Department cannot keep its provisional promise. This probably is the fact which gave rise not long ago to a statement in a lay paper that all the medical students who were serving in combatant positions in the Army would shortly be demobilised and sent back to their medical schools. No such sweeping policy is possible at the moment. The present Instruction is that students who had begun their curriculum prior to August 1st, 1914, and had at the time of enlistment completed two years' course, may claim to be returned to their studies. It is this Instruction which will probably have to be bettered, similar facilities for taking up their medical curriculum being extended to second-year students.

Sir DONALD MACALISTER referred also to the position in the Royal Navy in connexion with medical students, for with regard to this Service, so far from being able to expect an increase in the number of students who can be relieved from combatant duties and returned to the medical schools, the call is for senior students, who are wanted to discharge medical functions. Third-year students who have passed the examination in anatomy and physiology are able to serve as surgeon probationers in certain capacities in the Navy, and to withhold such young men from the work would only be to make the demand for qualified medical men, already so hard to meet, still more acute. But from Sir DONALD MACALISTER we learn with pleasure that the period of service of these junior officers is only to be six months, and that those six months will count

as part of their curriculum, and will therefore not delay their ultimate qualification. More, their term of work with the Navy may afford them experience that will later be of great value in practice.

The Surgical Complications of the Enteric Fevers.

THE manifestations of enteric fever are for the most part of medical interest, and it is comparatively rarely that the surgeon is called upon to intervene in the treatment; but the wide experience of this disease which the course of time has given us has shown that in every large epidemic there are some cases requiring surgical treatment, and the lecture by Lieutenant-Colonel A. E. WEBB-JOHNSON, reported in the present issue of THE LANCET, gives a lucid account of these surgical complications. The discovery within recent years that enteric, which was only separated from other continued fevers after many years of careful observation, was not one disease, but rather a collection of three diseases resulting from the activities of a group of closely allied organisms, is, of course, of much more medical than surgical importance, but even in connexion with surgery it is not without significance. With regard to general severity and mortality we have learned that the differentiation of the diseases of the enteric group has shown that the paratyphoid forms are of decidedly less severity than the true typhoid form, and it may also be said with certainty that, so far as the surgeon is concerned, there is much less frequency of the need for surgical treatment in paratyphoid than in typhoid itself.

Perforation of the bowel is probably the most important surgical complication, and statistics show that it occurs with decidedly less frequency in the paratyphoid group. Equally remarkable is the influence of inoculation. In those who have not been inoculated perforation occurs with more than six times the frequency which we expect to meet with among the inoculated. Here there is a curious point: in paratyphoid the ulceration tends to involve the large intestine to a much greater extent than in the other form, and that will doubtless account for the fact that in paratyphoid a large percentage of the perforations occur in the large intestine. It is no easy matter to detect perforation; it occurs most commonly during the period when generally the patient is in a semi-conscious condition, so that signs of pain may be entirely absent, and the only indication may be sudden collapse. As to the treatment of perforation there cannot be two opinions. Although the patient is probably not in a condition to invite operation, yet there can be no doubt that to open the abdomen immediately is the only possible course. It is true that patients have survived undoubted perforation without an operation, but the probability of this occurrence in any individual case is extremely small. Still, now and then restrictive peritoneal adhesions may form and wall off the perforated bowel. Unfortunately, the statistics of operation for intestinal perforation are not good, but many cases have been saved, and the hope of the future lies in earlier diagnosis, followed by immediate operation. There is undoubtedly a great risk that the typhoid group of bacilli may attack the liver or the bile-ducts, and as in the enteric fevers the liver has to strain the blood of the portal vein and to separate from it the infective micro-organisms, it is not strange that these germs in their course along the bile-ducts should sometimes attack the walls of the channel, and so give rise to one form or other of inflammation. Cholecystitis is the most important of these and the skill of the surgeon may be invoked to deal with it. The formation of gall-stones has always been somewhat of a mystery, but there is much evidence that micro-organisms have a share in their production, and we may regard it as proved that the typhoid bacilli are in no little degree responsible for the formation of many biliary calculi.

That thrombosis may occur in typhoid is well known, and citrates have often been given internally for its treatment, but Colonel WEBB-JOHNSON tells us that Captain H. F. MARRIS has had wonderful results with the intravenous injection of a weak solution of sodium citrate in normal saline. Bacilluria is common in this group of diseases, and therefore it is not strange that affections of the genito-urinary tract are sometimes seen in the course of typhoid and its allies; and, further, Colonel WEBB-JOHNSON suggesting that the bacilli may be responsible for some of the cases of urinary stone, urges that urinary calculi should always be examined bacteriologically. The affection of one or both parotid glands is, without doubt, due to the passage of the typhoid organisms through the duct of Stenson; the condition is severe, but as it occurs mainly in those who are in a very low condition it is rather as an indication of the general weakness of the patient that the affection specially deserves notice. The typhoid diseases of joints and of bones, and especially of the spine, are often of serious moment, and the prompt recognition of their nature is highly valuable for treatment. It will thus be evident that the surgical importance of complications of typhoid is great, and that the surgeon is able to give aid in directions that were quite undreamt of by the therapeutists of a few years ago. This is the sort of position that spells progress, which is always indicated when a pathological condition passes from a distinctly surgical or medical sphere into one for common consideration.

THE Third Annual Report of the Medical Research Committee, which has just appeared, is a record of work which is not merely of immediate importance to the naval and military forces, but which, by throwing new light on a number of medical problems, is likely to modify profoundly practice in the future. The Committee welcomes the growing trust in the value of research evinced by the public, and appeals for an increase in the funds available for rapid and effective research work.

Annotations

"Ne quid nimis."

DR. JAMESON.

Sir Leander Starr Jameson, known to the end of his stirring career as Dr. Jameson, although all the activities which earned him a place in national history were independent of his original career of medicine, died on Nov. 26th at the age of 64, to the deep regret not only of his large circle of personal friends but of the public at large, including that section which during the most prominent part of his life was violently opposed to his policy. The development of South Africa was his life-work, but his early training for a profession which demands accurate observation, strenuous application, and a keen interest in human nature, counted for much of his success in political administration, and in his ability to make a decision and to take a broad-minded view of opponents. Thus it was that his enemies became his friends. Born in Edinburgh in 1853 he was a successful student at University College Hospital, and after qualifying in 1875 as a Member of the Royal College of Surgeons of England and graduating M.B., B.S. at the University of London, he won the gold medal for medical jurisprudence. He obtained the M.D. two years later, and showed every promise of becoming a prominent member of his chosen profession, but his health failing he went to Kimberley, where, in 1878, he entered into medical partnership. His skill and a charm of manner which was operative because it arose out of a natural simplicity and was clearly not assumed with any desire to please, attracted to him British and Dutch patients, and in course of time he met Cecil Rhodes, whose influence dominated his after-life, so that the two names must always be associated in the wonderful developments which have followed British rule in South Africa. On the invitation of Rhodes, in 1888 Jameson undertook a mission to Lobengula, whose gratitude he gained by curing the great chief of gout, thus repeating the course of events which often took place during the spread of British rule in India, when the medical officers of John Company proved over and over again their value as imperial agents. From 1891 to 1895 he acted as Administrator of Rhodesia, and was decorated for his services. The story of his connexion with the South African war, including the celebrated raid and the subsequent trial, need not be dwelt on here for it is all history; but it was characteristic of Jameson that he never denied his principal responsibility for what happened. During the war, when he was besieged in Ladysmith, he contracted typhoid from his own servant whom he was nursing, and his health in England, while the events of the raid were the subject of trial, and while he was serving the first six months of his sentence, was more than a little anxious. Complete recovery, however, ensued, and he returned to South Africa, and was elected a member of the Cape Legislative Assembly in 1900, becoming, in 1904, Prime Minister for Cape Colony, two years after the death of Rhodes. This position he held for four years. He was made a Privy Councillor in 1907 and a baronet in 1911, and a year later, owing to ill-health, resigned his seat in the Union Parliament and returned to England, succeeding the late Duke of Abercorn as president of the British South Africa Company. Continued ill-health prevented him from taking a very active part in public affairs during later years, but as chairman of the Central Prisoners War Committee and as the organiser of private hospitals abroad he continued to the very end to maintain his reputation for strenuous labour in the cause of the British Empire. The medical profession has every reason to be proud of having supplied to the nation, in the person of Dr. Jameson, a great citizen and patriot.

ELECTRICALLY HEATED BEDS.

A WARM bed is the most important matter for a patient suffering from pneumonia—Sir Dyce Duckworth quotes[1] Sir William Gull as saying. And in view of the elaborate care with which most details of sick nursing have been worked out it is more than a little curious that the maintenance of the patient's warmth in bed should have been left so long to the precarious ministry of the hot-water bottle. If the aim is to maintain an even temperature it is obvious that any system of intermittent heating is very unsuitable for the purpose. Water has a high specific heat which, when contained in a badly conducting envelope, it parts with slowly, but at best with the rubber bottle the bed temperature is a constantly fluctuating quantity. Various efforts have been made to solve the problem by the use of a continuous electric current passed through suitable resistance, but these have failed for the most part in not providing for the wear and tear inseparable from bed-using and bed-making. A successful solution has now been reached by Mr. H. J. Gauvain at the Treloar Cripples' Hospital, Alton, where two wards are now supplied with electric mattresses which have proved both safe and convenient in practice even when a child is the occupant of the bed. The mattress does not differ in appearance from any other except that a flexible wire enters it at the head end through a terminal which is flush with the surface and therefore not exposed to injury. The resistance wire is insulated by glass beads in flexible metallic tubing incorporated in the substance of the mattress. The mattress is differentially heated and the heating element is so disposed that the maximum warmth is generated at the foot end, less in the middle, and none at all at the head end. This distribution of heat is maintained in whatever position the mattress is turned, either from head to foot or side to side. The wires are connected with a switchboard on the wall at the head of a bed which contains a variable resistance, so that the current can be graduated to any required extent. It is so arranged that when the current is full on the temperature of the bed is raised 25° to 30° F. above that which would obtain apart from the heating, and this has been found in practice to meet the needs of the small cripples, many of whom are fastened on splints which do not allow of the close contact of the bedclothes. A fuse prevents the passage of any current exceeding this amount. Several of the usual difficulties have thus been met: the temperature of the mattress cannot rise to any dangerous degree, the tubing is so flexible that the mattress can be shaken or rolled up, and the resistance wire is waterproof in the spiral metallic tubing, so that no short-circuiting results, even if the mattress is wetted. The mattress may be sterilised in the ordinary way. The system is equally applicable whether the bed be in or out of doors. The saving of time at the Cripples' Hospital amounts to an aggregate of three hours a day in each ward where the electric mattress has replaced

[1] Some Clinical Aphorisms. London: Spottiswoode, Ballantyne, and Co., Limited.

the filling of hot-water bottles, while inasmuch as the current required for maximum heating is only half an ampère at 110 volts, the total expenditure of energy for 200 or more beds would be by no means prohibitive. We believe that the general adoption of a similar appliance in hospitals and infirmaries would save much time and relieve the nursing staff of a tiresome routine. Electrically heated beds have already been found of advantage in the treatment of shock at field hospitals, and for military purposes it will be seen that the current required may be instantly supplied from a portable dynamo driven by a motor lorry or car attached to a field hospital. This is of especial importance in circumstances where water for hot-water bottles is not readily available and the means of heating the water required is limited.

THE DEATH OF DR. ELSIE M. INGLIS.

WE deeply regret to record the death, in her fifty-third year, of Dr. Elsie M. Inglis at the English port whither she had just returned from Rumania. Born in India, educated at Hobart and Edinburgh, she was, when war broke out, joint surgeon and gynæcologist to the Edinburgh Hospital for Women and Children, but gave up her post to organise, with indomitable spirit, the Scottish Women's Hospital Units, which have relieved untold misery in France, Serbia, Corsica, Salonica, Rumania, and Russia. Her wonderful work is a story of medical administration under circumstances of supreme difficulty, and when it comes to be told in full she will be recognised by all as one of the bravest among the many heroines and heroes whom the world catastrophe has called from private life to glorious patriotic endeavour.

THE TRANSMISSION OF PLAGUE BY BED-BUGS.

THE possibility of the transmission of plague by bed-bugs has long been recognised by experts. There is also no doubt that these insects can give rise indirectly to the disease, as, for example, when a bug has fed on a human case of septicæmic plague and has afterwards been intentionally or accidentally squashed; the contents of its stomach containing the *Bacillus pestis* may, through an abrasion of the skin of the person touching the squashed insect or its stomach contents, infect that individual. Some interesting experiments and observations upon the subject have lately been carried out by Lieutenant-Colonel J. W. Cornwall, I.M.S., and Assistant Surgeon T. Kesava Menon, I.M.S., of the Pasteur Institute of Southern India, Coonoor, and published in a recent number of the *Indian Journal of Medical Research*. These investigators held the opinion that there was no reason why bugs should not infect themselves from human beings suffering from septicæmic plague, and that if these insects ever feed upon rats or mice they could equally well infect themselves from these animals. During the inquiry it was found that while some bugs allowed to feed on a septicæmic plague case die in a few days from the infection, others may survive as long as 38 days and the plague bacillus may be recovered from their stomachs by culture at the end of that time. Bugs, therefore, which have fed on a patient with septicæmic plague are to be regarded as a potential source of danger. The experiments showed, too, that bed-bugs cannot regurgitate, like the fleas, the contents of their stomachs in the act of feeding; so that if they ever transmit plague by biting, they must do so by washing out with their saliva the plague bacilli which may have been stranded in their sucking tube. But these bacilli are not likely to remain in the sucking tube for long after an infected feed. It cannot, then, be said for certain as yet whether bugs can, or cannot, transmit plague by biting. It is satisfactory, however, to find that the conclusion arrived at by the above-mentioned investigators is to the effect that there is small likelihood that human plague is transmitted by bugs, biting under natural conditions.

THE MUNITION WORKERS' FOOD.

THE Health of Munition Workers Committee has submitted a report prepared by Dr. Leonard E. Hill, F.R.S., on a thorough inquiry into workers' food, together with some suggestions as to dietary. Captain M. Greenwood, R.A.M.C., helped in the investigation, and the Committee consider that the new material now presented is likely to prove of substantial value in connexion with practical problems. In the introductory paragraphs of the report a general survey is given of the body's necessities in regard to food. The results of the inquiry follow. In order to determine the kinds of dietaries provided for munition workers specimen meals were obtained, by personal visit or otherwise, from a number of canteens attached to munition works and, to serve as a contrast, from other sources as well. The amounts of protein, fat, and carbohydrate were estimated and the calorie value calculated. The investigation was thus carried out on the actual conditions of practice. The results obtained showed that the average canteen dinner is a good one, containing, as it should, an energy value of about 1000 calories, well distributed among the amounts of protein, fat, and carbohydrate. Apart from calorie value, an inspection of the dinners showed that meat, vegetables, and puddings were made of good materials and well cooked. For the relief of monotony, which is pointed out as an important factor in connexion with industrial canteens, a change of surroundings during the meal and a short walk before partaking it are held to be desirable. On this account, and also on account of the importance of ventilating the workshops so that the air may be fresh when the workers return, it is recommended that the custom of eating meals within the workshops should be discontinued, and that all food should be taken either in a canteen or restaurant, in the open air, or, at least, away from the ordinary place of work. The next subject investigated was the nature and energy value of meals brought by workers from their own homes. The workers from whom meals for analysis were obtained were not asked beforehand to bring a sample meal, but were interrogated at the entrance gate, and asked to exchange the contents of their dinner basket for a sum ample to buy a meal at the canteen. The results showed that a meal of rabbit and vegetables in a basin brought from home by a man on night shift, gave a total energy value of 683·4 calories. In another instance the meal, consisting of sausage roll, bread and butter, and ham and cheese, gave 1448 calories; while a meal brought from home by a boy, consisting of a dish of potatoes, tomatoes, and bacon, jam puff, a cake, bread, butter and jam, equalled 1719 calories value. As is pointed out, the boy's meal with its 1719 calories as contrasted with the 1346 of the canteen meal or with the 1448 of the man, illustrates the effect of growth and work in pro-

ducing appetite, but even so, the variations are probably excessive. The dietaries of women workers were next examined, when the results varied. In the case of one restaurant the meal was a sensible one and supplied at small cost. In another restaurant was found an example of "the unsatisfying meals which pale-faced young women may often be seen consuming in popular cafés." Recommendations are made to bring the canteen meal for women workers up to between 500 and 700 calories value. It was found that the food brought from home by girls varied greatly in nutritive value—namely, from 295 to 1143 calories. While the latter is sufficient without anything from the canteen, the former is not regarded as enough even if a double helping of pudding were added. The dietaries provided at the hostels, required on account of the inadequacy of pre-existing accommodation for housing the suddenly increased personnel of certain large munition factories, showed that the requirements of factory workers were met, unless very heavy work is being done. In some cases the calorie values might be reduced, as when there are facilities for getting extra food for those who want more. A useful table is given setting out the energy values of foods which may replace, or be substituted for, the foods contained in the ordinary dietaries. The report is a valuable one and eminently practical in character. It is pointed out that the nation is working harder than before the war. There are 4½ million women now at work, and elderly men have come back to occupation. Many children are also working, and all round the nation's need for food has considerably increased. One important conclusion in the report will receive general endorsement; it is that the immediate remedy for a threatened scarcity lies not in a reduction of food needed for the performance of work, but in a saving of all waste, a complete utilisation of all food fit for human consumption, an increase in the home production of food, and so an extension of the food-supply. Dr. Benjamin Moore, F.R.S., gave valuable assistance in the inquiry and Mr. A. Webster carried out numerous analyses.

MEASLES CONSIDERED AS A RESPIRATORY DISEASE.

IN later numbers of the *Military Surgeon* (Washington, D.C., U.S.A.) Lieutenant-Colonel E. L. Munson completes his case for regarding measles from a military point of view as a respiratory disease with a rash as a sequela. He bases his view on the story[1] of an outbreak of 443 cases of measles which occurred last spring at Camp Wilson, San Antonio, Texas, in a division of 13,773 men. 136 cases per 1000 occurred among the 2400 men of two regiments who neglected the prophylactic measures he prescribed for them, while the 11,000 men who obeyed had only 10 cases per 1000. Colonel Munson directed his measures of prophylaxis as against an acute respiratory disorder, infectious during the four days following invasion and with an incubation-period of 10 to 14 days. In January there were already in camp many cases of respiratory disease, bronchitis and the like. To prevent these he ordered better ventilation of tents, and the sunning and airing of bedding. In those regiments which carried out these divisional orders respiratory disease fell to a minimum, and when the measles infection, which had been threatening the camp from San Antonio, actually arrived, it had the less chance to spread, particularly as all cases of catarrh with pyrexia, those that complained as well as those that were discovered by search, were isolated till the rash appeared (98 cases) or until, after four days, it was evident they were not cases of measles. When a case was diagnosed as measles all the other men of that tent were sent to the quarantine camp with their tent, bedding, and other belongings for disinfection and isolation; 74 cases did actually appear among these contacts. Regiments which carried out these orders escaped the epidemic. A great deal, Colonel Munson contends, depends on the personality of the commanding officer. He cites as an instance an artillery unit which on Jan. 16th had a sick rate of 7·9 per cent. On the 17th its colonel returned from two months' leave. He at once insisted that sanitary regulations were enforced as prescribed, and in six weeks' time his unit's sick list was reduced to one-fifth, or 1·5 per cent., while in the same period the sickness-rate in the careless regiments had trebled. In the latter the captains of unhealthy companies were noted to be officers of little military credit. In fact, the whole history of this epidemic enforces the conclusion of the reporter—that the health of an army is a function and a test of its military discipline. Colonel Munson's report should be read by all military medical officers and may be of help to sanitary authorities in the management of measles epidemics.

[1] THE LANCET, 1917, ii., 88.

THE METROPOLITAN WATER-SUPPLY.

THERE were fluctuations in rainfall over the Thames basin during the three months July, August, and September, the fall being 1·93 of an inch above the average mean rainfall during the previous 34 years in July, 3·18 inches in August, and 0·08 of an inch in September. In July the results of the chemical examination showed that all three raw river waters improved in quality, but in August, with a comparatively big rainfall, there was a general deterioration in chemical quality, while matters improved again in September. Bacteriological results in July showed that the raw waters contained fewer bacteria than their respective averages for the year 1916, and the same result is reported for August and September. The filtered waters in all three months gave, generally speaking, not unsatisfactory results. In July, whereas 99·9, 77·1, and 63·6 of the samples of raw Thames, Lee, and New River water respectively contained typical *B. coli* in one cubic centimetre of water, 78·1, 72·7, and 84·5 per cent. of the filtered water samples derived from the Thames, Lee, and New River respectively contained no typical *B. coli* in 100 times as much water examined. In August 99·8, 100·0, and 80·9 per cent. of the samples of raw Thames, Lee, and New River water respectively contained typical *B. coli* in one cubic centimetre of water, while 60·8, 66·7, and 61·9 per cent. of the filtered water samples respectively from the Thames, Lee, and New River contained no *B. coli* in 100 cubic centimetres of the water. In September, whereas 95·0, 89·4, and 40 per cent. of the samples of raw river waters contained typical coli in one cubic centimetre examined, 68·3, 60·0, and 80 per cent. of the filtered waters contained no typical *B. coli* in 100 times as much water examined. The importance of the efficiency of the filtration and other purifying processes at our great waterworks is again illustrated, and the result is a practically sterile supply.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

TUESDAY, NOV. 27TH.

THE General Medical Council commenced its winter session at its offices, Hallam-street, W., Sir DONALD MACALISTER, the President, being in the chair.

New Members.

The following new members took their seats: Mr. MEREDITH TOWNSEND, M.R.C.S., L.S.A. (as representative of the Society of Apothecaries of London for one year), and Lieutenant-Colonel HARRY GILBERT BARLING, C.B., F.R.C.S. (as representative of the University of Birmingham for five years).

Presidential Address.

Sir DONALD MACALISTER commenced his address by regretting the resignation from the Council of Dr. Robert Saundby, whose place had been taken by Lieutenant-Colonel Gilbert Barling, and of Dr. George Wilks, who had been succeeded by Mr. Meredith Townsend; and by expressing sympathy with Dr. John McVail, the present Crown member for Scotland, on the death of his distinguished brother, Sir David C. McVail, who five years ago had occupied the same position on the Council for 20 years. He then pointed out that the medical duties of the Army Recruiting Department had now been transferred to the Minister of National Service, where the new Minister, Sir Auckland Geddes, himself a medical practitioner, was assisted by a Medical Advisory Board. The Ministry further, through coöperation with the Statutory Professional Committees in England and Scotland, came into connexion with the Local Medical War Committees, so that an organisation, he said, now existed which was designed to meet fairly the distribution of medical service between military and civilian needs. He continued:—

In several of my addresses since the war began, I have expressed the conviction that the withdrawal of students from the medical schools for combatant service would deprive the country of the necessary quota of new practitioners in the years 1918 and 1919. I have continued to press this conviction on the authorities, and have been enabled to support my view by the aid of statistics courteously furnished for the information of your Emergency Committee and of the Government by the Deans of medical faculties and schools. You will remember that in January, 1917, a census of students actually engaged in professional study showed that in the third year of the curriculum we could count only on 572 men and 261 women to provide in 1919 for the necessary accession of new practitioners to the Register. In normal times this accession should number about 1100. Only by returning third-year students then on active service could the deficiency be made good. In September the Army Council, by an instruction subsequently amended in one point, directed that students registered prior to August 1st, 1914, who had before enlistment completed two years of the curriculum, should be passed out of combatant service to resume medical study and proceed to qualification.

In order to determine the effect of this instruction, and to provide data for further action if necessary, the Minister of National Service requested that a fresh census of medical students in actual attendance during October, 1917, should be taken. The forms sent out by the Registrar were returnable on Nov. 14th, and nearly all have now been received. So far as they go they show the following aggregate results, as compared with those of January, 1917:—

1917		Men.	Women.	Total.
First-year students	Jan.	1449	674	2123
	Oct.	*1386*	*764*	*2150*
Second-year students	Jan.	987	472	1459
	Oct.	*871*	*642*	*1513*
Third-year students	Jan.	572	261	833
	Oct.	*805*	*482*	*1287*
Fourth-year students	Jan.	851	164	1015
	Oct.	*709*	*194*	*903*
Final-year students	Jan.	1088	164	1252
	Oct.	*995*	*200*	*1195*

Of the men students of the first and second years over 820 were under 18 years of age in October, 1917, and about 180 are from places outside the United Kingdom. The third-year men students (who last year numbered some 520) have increased by about 230, and the women students by about 220. The fourth-year men numbered 709 and the women 194. Unless therefore all students of this standing are returned from service with the Navy or the Army, the supply of new men, duly qualified for the medical service of the country, cannot be maintained in 1919.

In the meantime the Minister has declared his intention to provide, if possible, that the supply of students in training shall be maintained at a level sufficient to ensure the annual accession of at least 1000 new medical practitioners to the Register. To effect this purpose it will almost certainly be necessary to extend the scope of the Army Council's instruction of September, either by relaxing its restriction to students registered prior to August 1st, 1914, or by including second-year students who on enlistment were sufficiently advanced in their studies to compass the Second Professional Examination within a few months.

On the other hand, the Admiralty makes an urgent demand for capable third-year students who have passed the professional examination in anatomy and physiology, and are able to render aid as surgeon probationers in the minor units of the Navy. To withhold these from their studies for an indefinite period of service would unduly postpone the date of their full qualification as practitioners, and would proportionately diminish the number annually added to the Register. The Medical Director-General of the Navy has accordingly arranged with the Ministry of National Service that the period of service of surgeon probationers shall not be longer than six months at home or 12 months abroad. The functions of a surgeon probationer being comparable with those of a surgical dresser or student assistant in surgical wards, licensing bodies generally have agreed to accept his surgical service afloat as equivalent to six months of the hospital attendance prescribed for the *minimum* curriculum. The Admiralty arrangement should therefore ensure that most of the surgeon probationers will return and qualify within the normal period; and in the meanwhile they will have gained experience relevant to their profession, which may hereafter stand to their advantage as practitioners.

The claims of the Army for fresh drafts from the civilian members of the medical profession continue, though it has become a serious problem how the claims are to be met. A War Office Committee, which included members of the Medical Council, visited the Western front during the summer for the purpose of discovering what economies in personnel, if any, might be made in the Medical Corps. Its report is not yet issued; but it is questionable whether any practicable economy can be commensurate with the continuous wastage due to the incidents of warfare. The devotion and success of the Medical Corps in preserving and restoring the health of our troops have been recognised in the warmest terms by the highest authorities; but the service is rendered at a heavy cost in sacrifice. The Registrar informs me that on almost every page of the Medical Register he has had some military distinction to insert. But too often, after making the insertion, he has had to remove the bearer's name as having "died on service." In the three years 1911-13, the average number of names annually removed from the Register "on evidence of death" was 620. In the year 1916 the number rose to 983. In the current year it will probably not be less.

The welcome coöperation of the United States of America, in sending over medical units in advance of its troops, has afforded the Allies some relief in this respect. Officers of the American Medical Service have accepted honorary or other temporary positions in hospitals at home and abroad, and have thus released British officers and practitioners for other work. But we shall not be able to count on this help after the arrival in Europe of the American forces in full strength. And, again, we cannot count on American civilian practitioners to furnish many accessions to our Register. In the absence of American Federation legislation authorising professional reciprocity between the United States and Britain, His Majesty in Council is debarred from applying the Medical Act, 1886, to the United States, and this Council has accordingly no power to admit American medical practitioners to the Register unless they pass a recognised examination in medicine, surgery, and midwifery, and so acquire a professional title registrable in this country. Where such legislation, within or without the Empire, has been accomplished, the Council has not failed to give it effect. Already the Foreign and Colonial List of the Register include over 1000 practitioners, and their legal status in regard to practice is the same as our own.

Sir DONALD MACALISTER then alluded to the public advantages which have accrued from the Midwives Act for England and Scotland, which have led to a similar measure having been proposed for Ireland; and to the working of the Venereal Diseases Act, 1917, which is now operative in some 40 English counties and boroughs. He mentioned that a Dental Service Committee, with a Subcommittee for Scotland, had now been set up to regulate the calls on the dental profession, both military and civilian, and referred at some length to the Special Committee appointed by the Lord President of the Privy Council to enquire into the questions raised by the Council's recent memorandum on the Dentists Act. The wide terms of reference of this committee include an investigation into the causes of the shortage of qualified dentists, the expediency of prohibiting unqualified dental practice, and the practicability of lessening, without impairment of efficiency, the time and the fees that have now to be expended to secure qualification. On these points, he said, his evidence and that of Sir Bertram Windle, and Mr. Harper, the Council's solicitor, had been received in a manner which sufficiently showed that the Special Committee was alive to the importance of the questions involved. After alluding to the modifications in the British Pharmacopœia which had been made in order to reduce the consumption of sugar and glycerine, he continued:—

In August the English Board of Education published a scheme, which has long been under consideration, for the establishment of a Secondary Schools Examination Council. It will include representatives of the English Universities and of the managers and teachers of State-aided schools throughout the country. It is designed to supervise the working of a system of leaving certificates for pupils under instruction in schools providing secondary education analogous to the system in operation in Scotland. The certificates are to be of two grades: one suitable for pupils of 16, and qualifying, if obtained "with credit," for admission to universities; and another, suitable for pupils of 18 who have undergone a full secondary course. In each grade the syllabus of instruction at the school, and the school record of the pupil, will be taken into account. When the scheme comes into effect it should practically solve the difficulties of the Council in regard to preliminary examinations, and by a method of which the Council has more than once expressed its hearty approval. At my request Dr. Norman Moore and Sir Francis Champneys have represented the Council in conference on the new arrangements with Mr. Fisher, the President of the Board of Education;

and I desire to thank them in your name for their efficient service. I understand from Dr. Mackay that a report will be offered by the Education Committee on this important subject. You will probably agree that it would be proper to await the actual introduction of the new scheme before resuming our discussion of the present system of multiple preliminary examinations. The proposed leaving certificate may, and I trust it will, supersede these examinations in England altogether, and afford a single guarantee of sound general education which the Council may safely accept as qualifying for entrance on a professional course in this country.

Sir DONALD MACALISTER also called attention to the reasons for believing that the present shortage of medical men had induced unqualified persons to assume professional titles or personate qualified practitioners, in which cases he said the Registrar was ready to examine carefully the claims made. With regard to the cases calling for judicial inquiry during the present session, he made particular reference to irregularity of medical certification. Instructions had been issued, he said, to all officials and members of National Service Medical Boards that every certificate from a man's private medical attendant was to receive due consideration and be filed for preservation.

Representation of Dentists on the Council.

Mr. THOMSON moved:

That steps be taken to promote legislation to secure the election of Direct Representatives of registered dentists upon the General Medical Council.

He pointed out that the Council had to deal not only with dental disciplinary cases, but with matters connected with dental education. Dental education was now really under the control of physicians and surgeons. Yet there were now some 5000 registered dental practitioners. He suggested that the time had arrived when they might fittingly be represented on a body which exercised supreme control over their profession. The advice of men who were actively engaged in the practice of dentistry was desirable in dental disciplinary cases, because they were likely to be more familiar with the difficulties which beset the honourable practice of their profession owing to the unrestricted position of unregistered practitioners. They were also well qualified to judge both as regarded the scope and variety of subjects, and the efficiency and experience required to practise their profession without detriment to the public. He was not wedded to the definite terms of his motion, but he did hope that the Council would express its approval of the general principle.

Mr. TOMES seconded, but he thought it was undesirable that the Council should pass a resolution which very definitely said how this dental representation was going to be accomplished.

Sir J. W. MOORE hoped that the motion would be withdrawn. He had always regarded it as a great misfortune that the profession of dentistry was separated from the general practice of medicine and surgery.

Mr. HODSDON, whilst he agreed that the representation of dentists in some form or another should be given, thought a better form of motion might be framed. He suggested that it should take this form—

That it would be of advantage to the Council, in administering the Dentists Act, if provision were made for the appointment to the Council, as assessors or members, of representatives of the dental profession.

Some members considered the employment of the phrase "assessors" as liable to give rise to misapprehension. The words "assessors or" were accordingly excised from the text of Mr. Hodsdon's suggestion, and in that form it was substituted for Mr. Thomson's motion.

This substituted motion, as thus amended, was, after some discussion, adopted.

Mr. THOMSON: I think the resolution should be sent to the Dental Committee.

The PRESIDENT: It should really be communicated to the Privy Council.

WEDNESDAY NOV. 28TH.

The Council devoted its sitting to the hearing of disciplinary charges against practitioners.

THE epidemic of dysentery in Prussia was sensibly diminishing (1864 cases, with 316 deaths) in the second October week.

APPEAL FOR THE QUEEN'S HOSPITAL FOR CHILDREN.—An appeal on behalf of the Queen's Hospital for Children, Hackney-road, which is in need of £7000 for maintenance purposes by the 31st of December, has been issued by the Mayors of Bethnal Green, Shoreditch, Stoke Newington, Hackney, and the chairman of the hospital. The institution, which receives children up to 14 years of age, has 170 beds, and an out-patient attendance of 180,000 annually. It supports also a convalescent home at Bexhill. Contributions should be sent direct to the secretary, Mr. T. Glenton Kerr, at the hospital, Hackney-road, Bethnal Green, E. 2, cheques being made payable to "Queen's Hospital" and crossed "Barclay's Bank, a/c of Payee."

NATIONAL INSURANCE.

The National Health Insurance Bill.

THE Bill to amend the Acts relating to National Health Insurance does not, to any appreciable extent, affect directly the practice of medical practitioners upon the panels. It is, in fact, concerned with such financial questions as came before the Departmental Committee recently presided over by Sir Gerald Ryan, including the strengthening of the financial position of Friendly Societies, and the adjustment of difficulties due to miscalculation of the incidence of sickness among women, and with the simplification of administration, particularly in matters affecting the societies. It has passed its second reading and no very material alteration of its provisions in committee is to be anticipated.

Clause 20 amends the law with respect to contributors to insurance who are inmates of hospitals, asylums, and other institutions enumerated in Section 12 of the principal Act, enacting a fresh subsection to take the place of Subsection 2. In this clause conditions under which contributions may be made to the institution in which the patient has been treated, from moneys due to him or her, are laid down, the conditions, as before, being such that no profit to any hospital from such a source is to be expected. Clause 31 provides for the application of certain provisions of the Arbitration Act, 1889, by regulations to be made by the Insurance Commissioners, in the case of inquiries as to the desirability of retaining the name of a medical man or pharmaceutical chemist on the list. The provisions referred to affect procedure and costs, and the costs of any such inquiry are taken from the control of the person holding the inquiry and assigned to the Commissioners.

Special provisions are now made with respect to married women, subject to certain specified conditions, by Clause 22, which enacts that "any woman being an insured person and a member of an Approved Society who marries, shall, if she gives to her Approved Society notice of her marriage within one month thereof, and notice of her election in that behalf within six weeks, after the date of her marriage, be entitled, subject to the provisions of this Act, in lieu of the ordinary benefits under Part I. of the principal Act, to receive by way of benefit payment of a sum of 40*s.* (in this Act referred to as 'marriage benefit') and also until the termination of the year next following the year in which she was married, or if she had ceased to be employed within the meaning of Part I. of that Act before being married, until the termination of the year next following the year in which she ceased to be so employed, to receive medical and sanatorium benefit."

Clause 36 amends Section 63 of the principal Act, which provides for inquiries into causes of excessive sickness and matters connected with it by ordering that where such an allegation as is contemplated by Section 63 is made by an Approved Society or Insurance Committee, and no agreement is arrived at with the person or authority concerned, the matter shall be referred to the Insurance Commissioners, but no application shall be made for an inquiry until the Commissioners are satisfied that a *prima facie* case for such is disclosed. In the same section (63) the inquiry held has for one of its objects the ascertaining whether there has been sickness "in excess of the average expectation of sickness by more than 10 per cent." For the words quoted the following are now substituted: "In excess of the amount of sickness which, in the opinion of the person holding the inquiry, ought, in all the circumstances of the case, to have occurred." The expression in connexion with sickness which admits that it "ought to occur" may strike some as a little strange, and presumably is intended to convey the meaning "might reasonably have been expected to occur."

The fate of funds arising incidentally to the administration of the Act from unexpected sources, such as the neglect of contributors to place themselves in a position to obtain the benefits provided by the Act, is always a matter of interest to the medical profession, as well as to others whose emoluments under the Act have not realised the more sanguine expectations formed by some in the days immediately following its introduction. Certain sums contributed in respect of which "no claim has been made by or on behalf of any Approved Society or any deposit contributor for the crediting of those sums to the society or the Deposit Contributors

Fund" are now to be applied "towards discharging the liabilities of the Insurance Commissioners to Approved Societies in respect of reserve values."

The Insurance Act Pharmaceutical Service.

The National Health Insurance Commissioners have recently sanctioned a small increase in the dispensing fees paid to panel chemists, and, in notifying the Pharmaceutical Society that the Treasury has given its authority to this additional allowance, the Commissioners state that the granting of it is conditional upon a satisfactory and adequate pharmaceutical service being secured for the ensuing year. Were it not for the fact that this proviso with regard to the adequacy of the service is in the nature of a standing formula, it might be inferred that the exigencies of war time had entailed a depreciation in the quality or the promptitude of the pharmaceutical service. But this is not so. The Commissioners are, it is understood, thoroughly satisfied with the way in which panel chemists have fulfilled their contracts. It is true that there have been occasional complaints, but these have been remarkably few, and the majority of them on investigation have been found to be groundless. On the other hand, a minority of the panel chemists have expressed strong dissatisfaction at the rates of remuneration, and there has been talk of "going off the panel" unless these rates were substantially increased. This minority, however, has failed to impress the majority, and when put to the test those of the minority who have had the courage of their convictions have been conspicuous by their rarity. The broad fact remains that the Insurance Commissioners are satisfied with the pharmaceutical service and that the Local Insurance Committees which are in intimate contact with the panel chemists and which have special subcommittees to investigate complaints are also satisfied. This is particularly gratifying in view of the difficult circumstances prevailing; many panel chemists are understaffed, but they, like the rest of the community, have proved themselves capable of putting in more work than they were accustomed to in the old days. Moreover, the prescription frequency has been rather lower and time- and labour-saving devices have not been despised.

It is, of course, admitted that all the general working expenses of pharmacists, quite apart from the colossal advances in the prices of drugs, have increased considerably during the past three years. Notwithstanding this increase panel chemists had been granted, up to the time of the concession already alluded to, only a very small extra allowance for dispensing medicines for insured persons. To be precise, the increase in the fee was 0·3*d.* per prescription. Obviously this was inadequate to meet the situation, and in granting a further addition of 0·45*d.*—to come into force on Jan. 1st, 1918—the Commissioners recognise this. It is estimated that the total sum per annum represented by this extra 0·45*d.* per prescription is about £54,000. Looked at as a whole this is a goodly sum, but apportioned among the whole of the panel chemists in England and Wales—in round figures about 9000—the average share will amount to a comparatively trifling amount, for £6 per head cannot be regarded as a very substantial extra war bonus. But since it is as much as the Commissioners are disposed to grant there is nothing for the panel chemists to do but accept it with the best grace possible.

PANEL RESIGNATIONS IN CHESHIRE.—The Local Medical and Panel Committee of the County Palatine of Chester on Nov. 19th handed in to the Cheshire Insurance Committee 152 resignations from the panel of doctors in Cheshire subject to the following two qualifications:—

1. The signatories are willing to accept service at the capitation rate of 10*s.* per head per annum (exclusive of drugs and appliances), calculated on the list of persons accepted by or assigned to them under Section 25 of Part III. of the Medical Benefit Regulations.

2. Should the Insurance Acts Committee of the British Medical Association, after the negotiations which they are at present conducting with the Commissioners, conclude a settlement satisfactory to the whole profession, then the signatories would be willing to accept that settlement and withdraw their resignations.

In a covering letter the Committee states that it had offered an interview with the Insurance Commissioners with regard to the whole matter, but had been informed by them that Exchequer moneys and the interests of practitioners being involved, the Commissioners were not in a position to treat with individual panel committees.

Correspondence.

"Audi alteram partem."

THE SOURCE OF SPIROCHÆTES IN URINE.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 17th Captain C. P. Symonds, R.A.M.C., suggests that the urinary spirochætes described in our article in THE LANCET of Nov. 3rd might be an accidental contamination derived from the lower urethra or prepuce. Lieutenant James L. Stoddard, M.O.R.C., U.S.A.,[1] has shown that spirochætes (not of the *refringens* type) can be found in the urethra of 33 per cent. of cases selected from healthy individuals and hospital patients; this observation would appear to lend colour to the suggestion put forward by Captain Symonds. Since our paper was forwarded to you for publication we have found the spirochæte in a catheter specimen of urine from a case of trench fever. Again, one of our positive cases gave negative urethral scrapings daily over a period of a week.

The fact that a number of apparently healthy persons are affected with a urethral spirochætosis does not necessarily prevent them from developing a renal spirochætosis as well. Would Captain Symonds suggest that the urinary spirochætosis of Weil's disease is of urethral origin? Of 100 cases of Weil's disease some 33 might have a urethral spirochætal infection, but careful search at the right stage of the disease would reveal the existence of urinary spirochætes (*S. icterohæmorrhagica*) in them all. Of our cases of trench fever—with the exception of three which were examined once only—all showed the presence of spirochætes.

We may summarise our reasons for believing that the spirochætes which we have described do not originate in the lower urinary passages as follows: (1) They have been found in a catheter specimen. 2. They appear in the urine when urethral scrapings are negative. 3. They can be found in all cases of trench fever if diligent search be made, and *not* in only 33 per cent. 4. They are not present in every specimen of trench fever urine—in one of our cases they were present in five samples only ou of 21 examined; had they originated in the urethra or prepuce it is permissible to suppose that they would have been present in every specimen. 5. They are most numerous in the urine about the sixteenth day of illness.

Clinically, trench fever presents features common to protozoal diseases—viz., the periodicity of the pyrexia, the peculiarly intense headache, and the delayed onset of the characteristic limb pains. It is also of interest to note the observation of Moreland McCrea and Carnegie Dickson[2] that the blood in late stages of the disease gives a positive Wassermann reaction.—We are, Sir, yours faithfully,

A. T. NANKIVELL,
C. E. SUNDELL.

Stationary Hospital, B.E.F., Nov. 19th, 1917.

WAR DEAFNESSES.

To the Editor of THE LANCET.

SIR,—In reply to the letter of Dr. Dan McKenzie in your issue of Nov. 17th, I beg to say that I have carried out vestibular tests in many cases of "perceptive deafness," and that I am acquainted with his views as expressed during the discussion on nystagmus.[3] Neither my own experience nor Dr. McKenzie's observations tend to make me in any way modify the opinion expressed in my previous letter. That letter was written to discuss the question whether the presence of vestibular reaction could be used as a diagnostic of hysterical deafness, and my contention is that in this relation it is "not of supreme importance." I am quite ready to admit that its absence would be strong evidence in favour of an organic lesion of the labyrinth, but that aspect of the matter did not call for consideration, if only because the proposition is self-evident.

Let me put this query to Dr. McKenzie: Does he seriously believe that a man deaf from gun-fire who responds more or

[1] Brit. Med. Jour., Sept. 29th, 1917.
[2] THE LANCET, 1917, i., 796.
[3] Proc. Roy. Soc. Med., Otolog. Sect., April, 1914.

less normally to vestibular tests is either hysterical or malingering? If he does not, I cannot understand why he refers to the views expressed by me. If he does, he undertakes a very serious responsibility, for all of us see many men, deaf as the result of explosions, whose future will depend largely upon the reports furnished by otologists.

It would occupy too much space to criticise Dr. McKenzie's views seriatim, but I may perhaps allow myself one or two remarks. Among his cases are some in which he himself admits organic lesion of the internal ear, and yet vestibular reactions were normal or increased. The occurrence of such instances would, in common justice, negative the assumption that the presence of a normal vestibular reaction is indicative of purely functional trouble. Again, it appears to me that Dr. McKenzie is too prone to assume that deafness is functional. For example, he says, "bearing in mind, however, the fact that hysterical or functional deafness, like any other manifestation of this disorder, is often obstinate and persistent." Now, as I pointed out in my previous letter, hysterical deafness can only be diagnosed with certainty after it has been cured, therefore it cannot be diagnosed with certainty *while it persists*. It may, indeed, be strongly suspected, but can Dr. McKenzie give any other absolute proof? Apart from the presence of a suggestive history or the existence of unmistakable hysteria, can he even give a list of symptoms which would afford very strong reasons for suspicion?

I am, Sir, yours faithfully,

Edinburgh, Nov. 19th, 1917. P. MCBRIDE.

CIRCINATE RASHES AFTER ANTITOXIN.

To the Editor of THE LANCET.

SIR,—In an annotation in your issue of Nov. 17th you write: "With the production of an antidiphtheritic serum of high potency the appearance of serum disease, so frequent in the early days of antitoxic treatment, diminished almost to vanishing point." The following figures show the percentage incidence of serum rashes during the treatment of diphtheria in the hospitals of the Metropolitan Asylums Board from 1898 to 1914 inclusive:—

Year.	Percentage incidence of rashes.	Year.	Percentage incidence of rashes.
1898	45·0	1907	25·0
1899	34·5	1908	30·3
1900	42·6	1909	30·3
1901	43·6	1910	30·6
1902	47·4	1911	30·6
1903	44·8	1912	30·1
1904	43·1	1913	31·2
1905	32·8	1914	32·9
1906	30·6		

I believe the actual incidence to be higher than these statistics indicate owing to failure to observe or note all rashes, but they are sufficient to show that, though a drop took place after 1904, serum disease has not "diminished almost to vanishing point."

You describe the rashes 20 years ago as follows: "Exanthem of urticarial type; more rarely rashes occur resembling scarlatina or measles." In a letter I wrote you referring to an article by Captain S. Wyard on anaphylaxis, and which you kindly published in your issue of Jan. 27th last, I drew attention to the circinate erythema as being next in frequency of occurrence to urticaria. In the *British Medical Journal* some 15 years ago, Stanley, I think, stated that the circinate erythema was more common than any other eruption. This has not been so for a number of years, but although the circinate erythema is much less common than the urticaria, it is not uncommon. Captain Wyard, in his letter in your issue of Feb. 10th, said the circinate rash had not come under his observation, but I presume his experience lay amongst adults. At all events, the fact that a circinate rash does occur, and that it is next in frequency, is well known to those experienced in serum disease.

Among those who have not undergone serum treatment previously the days of election for the first appearance of the urticarial rash are the seventh, eighth, and ninth after injection, and it may appear at any time subsequent to the injection up to the fourteenth or fifteenth day, but rarely later. In those who have undergone serum treatment previously the urticarial rash is almost invariably accelerated. It may appear within a very short time, and most commonly does so in about 24 to 48 hours. The circinate erythema occurs from about the tenth to the twentieth day, and is much more common in those who have suffered from a previous urticaria. It is true that continued high temperature does occur rarely, and also diarrhœa, but it has not been my privilege to see serum disease simulate enteric fever.

Anaphylaxis is rare, and I have not yet seen a case follow upon anti-anaphylactic treatment, but the anti-anaphylactic treatment does not appear to make any difference to the acceleration of the serum disease which I mention above.

I am, Sir, yours faithfully,

FREDERIC THOMSON.

North-Eastern Hospital, Tottenham, N., Nov. 19th, 1917.

RECURRENT ATTACKS OF FEVER.

To the Editor of THE LANCET.

SIR,—The disease discussed by Dr. R. V. Solly (Sept. 8th, p. 386) and Professor Tanner Hewlett (Oct. 8th, p. 552) can hardly be rat fever. I have recently attended a well-marked case for 12 months, in which rat infection could be pretty certainly excluded, or, indeed, a wound of any kind. The only organism found in the blood was *Bacillus fæcalis*, and the febrile attacks occurred on the average every 10 days.

The patient was an active, vigorous old man, in good health, except for some prostatic trouble. In the early part of October, 1916, he was attacked with fever, rigors, hiccough, and œdema of the right lower limb. No thrombosis could be detected, but the swelling continued. The fever returned from time to time and settled down to fairly regular attacks every ten days, which continued till his death, Nov. 5th, 1917. Between them he picked up and even got out of doors in fine weather. The onset was marked with a shiver, headache, and great drowsiness, and followed by obstinate hiccough and vomiting. The fever only reached 100° F. or 101°, and fell in a day or two. The pulse did not rise above 80. The leg remained white and œdematous for about nine months, but during one attack a red flush spread over it like an ordinary erysipelas. A cultivation was taken from near the edge of the œdema, and a vaccine was made from the *Bacillus fæcalis* found there by Professor I. Walker Hall. The result was remarkable, in that after two or three doses the massive swelling of the leg vanished entirely, but the patient so feared the reaction that he could not be induced to continue them or to have galyl. The febrile paroxysms went on. Sulphur, quinine, and cinnamon had no effect. He finally failed to take food and died much emaciated. The heart was at one time dilated and irregular, but recovered after the vaccine.

It was clearly not malignant endocarditis, nor erysipelas. Shearman and Moorhead noted 11 cases in Egypt in soldiers where this organism was found, but the relapses did not exceed two or three. The chills, vomiting, and slow pulse were present in their patients.[1] More often the *B. fæcalis* is not associated with clinical symptoms.

I am, Sir, yours faithfully,

Clifton, Bristol, Nov. 19th, 1917. GEORGE PARKER.

SIR RICHARD CROFT AND THE CASE OF THE PRINCESS CHARLOTTE.

To the Editor of THE LANCET.

SIR,—I much wish I could support my friend Dr. Hingston Fox in the two points he advances in this matter. The facts of the case, however, prevent my doing so.

1. Dr. Fox states that Queen Charlotte was attended in her confinements not only by Mrs. Draper, the midwife, but by Dr. William Hunter, the official accoucheur. If Dr. Fox will look into the "Obstetric Diary" kept by Dr. Hunter, and printed by Dr. Stark, he will see that Dr. Hunter was never called in until after the baby was born, and his official duty was limited to feeling the Royal pulse and examining the Royal placenta.

2. Upon the authority of Wadd, Dr. Fox states that Sir Richard Croft possessed the M D. degree. Wadd was a gossipy, merry writer, and would not, I think, be considered an authority in the matter. Neither the "D.N B." nor Burke's *Baronetage* gives Croft a degree. He practised medicine at Oxford for a short time, but the *Alumni Oxonienses*

[1] Brit. Med. Jour., Dec. 30th, 1916.

merely styles him "chirurgus priviligiatus," and mentions no degree. Those who think he graduated M.D. while at Oxford have probably confused him with his son, also named Richard, who was at Balliol College, and who graduated both in Arts and in Medicine.

That Sir Richard Croft was a brilliant practitioner there can be little doubt; that he was in no way responsible for the death of the Princess is equally certain; that he possessed a degree or a diploma is very questionable. He practised at a time when technical qualifications were not necessary. I am, Sir, yours faithfully,

S. D. CLIPPINGDALE, M.D.

Holland Park avenue, W., Nov. 25th, 1917.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

P. Ward to be temporary Surgeon.

ARMY MEDICAL SERVICE.

Col. (temp. Surg.-Gen.) H. N. Thompson, C.M.G., D.S.O., on completion of four years in his rank, is retained on the Active List, under the provisions of Arts. 120 and 522 Royal Warrant for Pay and Promotion.

Assistant Director of Medical Services: Temp. Major J. S. Jenkins, D.S.O., Canadian A.M.C., and to be Temporary Lieutenant-Colonel whilst so employed.

Deputy Assistant Director of Medical Services: Temp. Major A. Macphail, Canadian A.M.C.

Temp. Lieut.-Col. C. E. Doherty, Canadian A.M.C., relinquishes his appointment.

ROYAL ARMY MEDICAL CORPS.

Major E. L. Moss, M.C., to be acting Lieutenant-Colonel whilst in command of a Medical Unit.

R. M. Ranking to be Major.

To be temporary Majors: Temp. Capt. E. R. Fothergill and Temp. Capt. A. H. Cameron Smith, Canadian A.M.C., M.C.

Temp. Capt. H. C. T. Langdon to be temporary Major while specially employed.

M. R. MacKay, late temporary Captain, is granted the honorary rank of Captain.

Temporary Lieutenants to be temporary Captains: A. G. H. Lovell, H. V. Swindale, C. E. Pepper, W. J. Stephens, G. Lewin, D. C. Norris, K. W. D. MacRae, J. Leach, L. Leslie, A. G. Carment, W. A. Hotson, S. W. H. Stuart, R. A. Smith, W. J. Smyth, J. S. E. Selby, H. Ainscow, H. G. K. Young, B. H. Moore, B. Knowles, J. Laing, P. R. McNaught, J. Cruickshank, W. Montgomery, H. M. Grey, T. S. S. Holmes, J. A. C. Greene, J. Pryce-Davies, G. H. Morris, R. H. Rains.

A. MacD. Westwater to be temporary honorary Captain whilst serving with the Red Cross Hospital, Bellahouston.

Officers relinquishing their commissions: Temp. Major H. D. Harrison (on ceasing to be employed at the Welsh Metropolitan War Hospital). Temporary Captains: F. W. H. Hutchinson, R. Forbes (and is granted the honorary rank of Captain), H. Cross (on account of ill-health), S. K. Adams, J. W. B. Thorburn, J. C. Mackwood, F. P. Maitland, J. H. Parsons, R. P. N. B. Bluett, B. M. Bennett, W. McDermott, A. Moyse, J. Spencer-Daniell. Temporary Lieutenants: D. V. Muller (on account of ill-health), W. S. Wildman, A. J. Macvie, E. A. Bullmore.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: P. T. Jones, A. Rodd, I. Aubrey, M.C., R. B. Hawes, H. J. Duske, D. V. Murphy, W. J. M. White, E. O. A. Singer, J. H. Vance, E. Butler.

To be Lieutenants: R. N. Mackenzie, Capt. J. I. Watson (from Territorial Force Reserve), H. Taylor, C. Shaw-Crisp (from University of London Contingent, O.T.C.).

Capt. T. D. Renwick relinquishes his commission on account of ill-health caused by wounds.

TERRITORIAL FORCE.

Lieut.-Col. R. M. Wilson resigns his commission on account of ill-health and is granted permission to retain his rank and wear the prescribed uniform.

Major (temp. Lieut.-Col.) F. J. Steward, Capt. (temp. Major) H. W. Wilson, and Capt. (temp. Major) T. B. Mouat relinquish their temporary rank and are restored to the Establishment.

Major W. M. Sturrock and Capt. J. F. Neary resign their commissions on account of ill health.

Capt. J. G. Emanuel and Capt. J. Pearson are restored to the Establishment.

Capt. W. H. G. Ball is seconded for duty with a General Hospital.

Capt. F. V. Milburn is seconded for duty with a General Hospital.

P. G. Selby to be temporary Major, Kent Medical Volunteer Corps.

Attached to Units other than Medical Units.—Surgeon-Major A. C. Oldham, from R.F.A., to be Major, with precedence as from July 19th, 1912.

TERRITORIAL FORCE RESERVE.

Major D. E. Dickson, from R.A.M.C., to be Major.

Professor Max Henkel, Director of the Gynæcological Clinic at Jena, has been relieved of his post by a disciplinary court of the High Duchy on the ground of unprofessional conduct, "especially a lax indication for operative measures and for terminating pregnancy." Czerny, Lexer, Hofmeier, Winter, Puppe, and Binswanger were among the witnesses in the case.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualities announced since our last issue:—

Killed.

Col. W. W. Hearne, D.S.O., Australian A.M.C., qualified at Melbourne in 1894, and was in practice at South Melbourne, where he was anæsthetist to the Alfred Hospital since 1903, prior to joining the Expeditionary Force. The award of the D.S.O. was recorded in THE LANCET of June 9th, 1917, p. 894.

Major N. J. Bullen, Australian A.M.C.

Died of Wounds.

Capt. L. L. McKeever, R.A.M.C., attached Royal Scots, qualified in Ireland in June, 1914, and joined up in 1915.

Major W. L. MacLean, Canadian A.M.C., qualified in Canada in 1908, and was in practice at Glace Bay, South Cape Breton, Nova Scotia, prior to joining the Expeditionary Force.

Capt. G. A. Harvey, R.A.M.C., qualified at Adelaide, New South Wales, in 1911, and after holding an appointment at a local hospital came to England and registered in March, 1914, and became house surgeon at the West London Hospital. Soon afterwards he joined the R.A.M.C.

Died.

Capt. N. J. H. Gavin, M.C., R.A.M.C., qualified at Edinburgh in 1904, and held appointments at the Norfolk County Asylum and at the West Riding Asylum, Wakefield. Later he went to Dunedin, New Zealand, and on returning to England became assistant medical officer at the Menston Asylum, near Leeds, and before joining up was on the staff at the Three Counties Asylum, Arlesey, Hitchin. The award of the M.C. was recorded in THE LANCET of June 9th, 1917, p. 894.

Wounded.

Capt. C. F. Backhouse, R.A.M.C.
Capt. R. T. Cæsar, R.A.M.C.
Capt. J. F. Edmiston, R.A.M.C.
Capt. G. Hislop, R.A.M.C.
Capt. W. W. Morrison, R.A.M.C.
Capt. E. H. Scholefield, R.A.M.C.
Capt. D. P. Thomas, R.A.M.C.
Capt. D. A. MacLeod, Canadian A.M.C.
Lieut. A. S. Porter, Canadian A.M.C.
Capt. W. H. Scott, Canadian A.M.C.
Capt. H. W. Whytock, Canadian A.M.C.
Capt. W. A. Murphy, R.A.M.C., attached King's Own Scottish Borderers.
Lieut. A. Rodd, R.A.M.C., attached Royal Field Artillery.
Capt. W. L. Millett, Australian A.M.C.
Capt. E. L. Morgan, Australian A.M.C.
Capt. A. V. Glendinning, R.A.M.C.
Major W. M. A. Fletcher, Australian A.M.C.
Capt. W. K. Colbeck, Canadian A.M.C.
Capt. G. M. Foster, Canadian A.M.C.
Capt. B. R. Mooney, Canadian A.M.C.
Lieut. V. C. Montgomery, R.A.M.C.
Capt. H. P. Caithness, R.A.M.C.
Capt. A. H. Falkner, R.A.M.C., attached Royal Lancaster Regiment.
Capt. J. H. Paul, R.A.M.C.
Capt. T. A. Carson, Canadian A.M.C.
Capt. W. W. Morrison, R.A.M.C.
Capt. A. Jones, R.A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Capt. I. Heaton, Royal West Kent Regiment, died of wounds, only child of Dr. C. J. Heaton, of Westgate-on-Sea, Kent.

Capt. and Adjutant Sir H. G. T. Butlin, Bart., Cambridgeshire Regiment, reported wounded and missing Sept. 16th, 1916, now presumed killed in action, only son of the late Sir H. T. Butlin, Bart., President of the Royal College of Surgeons of England, 1909–11.

Second Lieut. W. S. F. Saundby, Yorkshire Regiment, reported missing Nov. 17th, 1916, now presumed killed in action, youngest son of Dr. R. Saundby, of Edgbaston, Birmingham.

Sergt. F. H. Clouting, Australian A.S.C., killed in action, youngest son of the late Mr. J. R. Clouting, F.R.C.S., of Thetford, Norfolk.

Second Lieut. M. L. Atkinson, Tank Corps, killed in action, only surviving son of Dr. M. C. Atkinson, of Leamington.

OBITUARY OF THE WAR.

KENNETH ANGUS MACCUISH, M.D. NOVA SCOTIA,

CAPTAIN, CANADIAN ARMY MEDICAL CORPS.

Captain K. A. MacCuish, who was recently killed on the Western front, at the age of 42 years, was a native of St. Peter's, Nova Scotia, graduated at Dalhousie University, Halifax, in 1903, and had been in practice at Glace Bay, Nova Scotia. Here he saw a considerable amount of major surgery, Glace Bay being a mining district, and fractures and severe wounds being not uncommon. When at the close of 1915 No. 9 Canadian Stationary Hospital was organised in his native province he joined it, coming over to England in the early summer of 1916. He was attached first to the Granville Canadian Special Hospital at Ramsgate, then for five months was the surgical specialist to the Bramshott Military Hospital, rejoining his unit in April, 1917, when this went to France. A hard and loyal worker and an excellent surgeon, Captain MacCuish rapidly made his name in the medical service. A recent action demanded its toll from the C.A.M.C., as from other units engaged. Captain Ireland, regimental medical officer to one of the Canadian battalions, having fallen in action, MacCuish volunteered from his unit to take his place, only to fall himself. His friend and partner at Glace Bay, Major McLean, attached to a Canadian casualty clearing station, died of wounds a few days later.

JOHN BEAUFOY RANDALL, B.SC., M.B., B.S. LOND.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain J. B. Randall, who was killed in action on Oct. 31st at the age of 28 years, was younger son of Mr. Wyndham Randall, M.R.C.S., of Bridgend, Glam. Educated at Bridgend County School, he took honours certificates of the Central Welsh Board, and graduated in science at University College, London, with honours in physiology. He then took his medical course at St. Bartholomew's Hospital, and graduated in 1914 with distinction in medicine. Before joining the R.A.M.C. he held for 12 months the post of house surgeon at St. George's Hospital. His early death terminates a career of much promise.

THE HONOURS LIST.

The following awards to medical officers are announced. The acts of gallantry for which the awards were made are not yet announced. All are members of the R.A.M.C. unless otherwise stated. The dates in parentheses, in those cases where bars have been awarded, refer to the number of THE LANCET in which a record of the original decoration will be found:—

Bar to the Distinguished Service Order.—Major (Temp. Lt.-Col.) P. J. Hanafin, D.S.O. (Jan. 22nd, 1916, p. 215); Temp. Capt. R. McC. Hill, D.S.O. (May 20th, 1916, p. 1059).

Distinguished Service Order.—Major W. B. Craig, Australian A.M.C.; Temp. Capt. J. C. Dunn, M.C.; Temp. Capt. E. H. Griffin, M.C.; Major W. A. Hailes, Australian A.M.C.; Major H. B. Lee, M.C., Australian A.M.C.; Major K. MacCormick, New Zealand M.C.; Major R. M. McMaster, Australian A.M.C.; Capt. and Bt.-Major H. F. Panton, M.C.

Bar to the Military Cross.—Temp. Capt. W. T. Brown, M.C. (Oct. 6th, 1917, p. 550); Temp. Lieut. (Temp. Capt.) H. A. Harbison, M.C. (Sept. 2nd, 1916, p. 450); Temp. Capt. C. R. R. Huxtable, M.C. (July 28th, 1917, p. 135); Capt. C. H. Leedman, M.C., Australian A.M.C. (July 28th, 1917, p. 136); Capt. Greg Mackay, M.C. (Sept. 30th, 1916, p. 620); Temp. Capt. C. J. O'Reilly, M.C. (Nov. 13th, 1915, p. 1112); Capt. P. J. F. O'Shea, M.C., Australian A.M.C. (Nov. 24th, 1917, p. 805); Temp. Capt. J. F. McG. Sloan, M.C. (July 28th, 1917, p. 136); Temp. Capt. G. Walker, M.C. (Nov. 18th, 1916, p. 881).

The Military Cross.—Capt. W. M. Abbott, New Zealand A.M.C.; Capt. D. L. Barlow, Australian A.M.C.; Capt. C. H. Brennan, Spec. Res.; Capt. J. H. B. Brown, Australian A.M.C.; Temp. Lt. (Temp. Capt.) R. J. Clausen; Capt. G. Crawshaw; Capt. A. Curtis, Australian A.M.C.; Temp. Capt. D. E. Derry; Temp. Capt. T. Duncan; Capt. F. Ellis; Temp. Capt. A. Gaston; Capt. S. G. Gibson, Australian A.M.C.; Capt. W. E. Graham; Temp. Capt. J. L. A. Grout; Lt. H. J. Henderson; Capt. C. E. K. Herapath; Capt. F. W. Kemp, New Zealand A.M.C.; Capt. D. Mackie, Spec. Res.; Temp. Capt. J. C. Mackwood; Temp. Capt. C. F. Maclachlan; Temp. Capt. W. S. Martin; Temp. Capt. J. L. Menzies; Temp. Capt. J. B. Mitton; Temp. Capt. J. H. Morris-Jones; Temp. Capt. J. H. Porter; Temp. Capt. N. P. Pritchard; Capt. J. Purdie, Spec. Res.; Capt. J. Raften, Spec. Res.; Capt. S. A. Railton, Australian A.M.C.; Temp. Capt. A. Randle; Capt. E. L. Reid, South African M.C.; Capt. H. A. Sandiford; Temp. Capt. W. L. Scott; Capt. F. B. Smith; Capt. E. C. W. Starling, Spec. Res.; Temp. Capt. J. G. T. Thomas; Temp. Capt. J. A. Tippett; Capt. A. A. Turner; Temp. Capt. J. W. Watthews; Capt. H. Whitaker; Temp. Capt. H. D. H. Willis-Bund; Capt. E. W. B. Woods, Australian A.M.C.

MENTIONED IN DESPATCHES.

In a despatch dated June 28th, 1917, received from General Sir A. Murray, G.C.M.G., K.C.B., late General Officer Commanding in Chief, Egyptian Expeditionary Force, dealing with the operations in Egypt under his command from March 1st to June 28th, 1917, the following reference to the medical services occurs:—

"The health of the troops has throughout been singularly good. All branches of the medical services, under Surgeon-General J. Maher, C.B., deserve the highest commendation for their successful work at the front, on the lines of communication, and in the base hospitals. The presence in the force of a number of civil medical consultants, who have so patriotically given their services, has been of the very greatest value, and they have worked in successful accord with the regular medical services of the Army. The Australian Army Medical Corps and the New Zealand Medical Corps have also been remarkable for their efficiency and unremitting devotion."

In a further despatch Sir A. Murray will submit the names of those whom he wishes to bring to notice for gallant and distinguished service during the period under review.

QUEEN MARY'S CONVALESCENT HOSPITAL, ROEHAMPTON.

A MEETING was held at Lady Wantage's house in Carlton-gardens on Wednesday last to discuss the future of this institution, wherein such splendid work has been done for limbless soldiers. Lieutenant-General Sir Francis Lloyd, chairman of the committee of the hospital, traced the history of the institution, summarised its work, and suggested that a formal appeal should be made to the public for at leeat £100 000 to ensure the proper continuance of its activities. Mr. Walter Long and Colonel Openshaw, chief surgeon to Roehampton Hospital, supported this view, which was unanimously adopted.

HELP FOR WOUNDED SAILORS AND SOLDIERS.—The Central Depôt of the Surgical Branch of Queen Mary's Needlework Guild, 2, Cavendish-square, W., calls the attention of medical men, matrons of hospitals, and others concerned with the welfare and comfort of the sick and wounded to the fact that one of the aims of the Guild is to supply the ordinary dressings, appliances, and comforts required for the troops at home and abroad, as well as special surgical appliances which a surgeon might have difficulty in procuring through ordinary channels.

THE LATE MAJOR PETER MACGREGOR.—Major Peter MacGregor, R.A.M.C., honorary surgeon to the Huddersfield War Hospital, who died on Nov. 15th after an illness extending over a year, was 62 years of age, having been born at Rannoch, Perthshire, in 1855. He received his medical education at the Edinburgh Medical School, qualifying in 1877 as L.R.C.P. & S. Edin., and taking the surgical Fellowship in 1892. After holding some medical appointments in Lancashire and in Kent he entered on practice in Huddersfield, where he quickly achieved success. In 1898 he became honorary surgeon to the Huddersfield Royal Infirmary, and did much to add to the financial resources of that institution, his efforts resulting in an augmentation of the workpeople's contributions from £1000 to £2200, a figure which was maintained for several years. He also assisted in the establishment of the Huddersfield Medical Society, of which he was a former president. In 1896 he was placed on the commission of the peace for the borough. He leaves a widow, two daughters, and one son.

URBAN VITAL STATISTICS.

(Week ended Nov. 24th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was equal to 12·3, against 11·8 and 12·2 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 13·1, or 0·6 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 5·2 in Ilford, 5·3 in Barnsley, and 6·4 in Ealing, to 18·6 in Brighton, 19·4 in Wigan, and 29·2 in Dewsbury. The principal epidemic diseases caused 275 deaths, which corresponded to an annual rate of 0·8 per 1000, and included 94 from measles, 76 from infantile diarrhœa, 51 from whooping-cough, 39 from diphtheria, 13 from scarlet fever, and 2 from enteric fever. Measles caused a death-rate of 1·7 in St. Helens, 3·6 in Acton and in Stockton-on-Tees, and 9·1 in Dewsbury, and whooping-cough of 2·2 in Gateshead and 2·7 in Stockton-on-Tees. The 1315 cases of scarlet fever and the 1588 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 54 and 101 above the numbers remaining at the end of the previous week. Of the deaths from all causes in the 96 towns, 157 resulted from violence. The causes of 26 deaths were uncertified, of which 7 were registered in Birmingham, 3 in South Shields, and 2 each in Gillingham, Liverpool, and Blackpool.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 12·2, against 11·9 per 1000 in each of the two preceding weeks. The 259 deaths in Glasgow corresponded to an annual rate of 12·1 per 1000, and included 7 from infantile diarrhœa, 6 from diphtheria, 3 from whooping-cough, and 2 from measles. The 63 deaths in Edinburgh were equal to an annual rate of 10·7 per 1000, and included a fatal case of scarlet fever.

Irish Towns.—The 115 deaths in Dublin corresponded to an annual rate of 15·0, or 1·9 per 1000 less than that recorded in the previous week, and included 5 from infantile diarrhœa, 2 from measles, and 1 from whooping-cough. The 109 deaths in Belfast were equal to a rate of 14·5 per 1000, and included 4 from whooping-cough, 2 from infantile diarrhœa, and 1 from measles.

VITAL STATISTICS OF LONDON DURING OCTOBER, 1917.

In the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 5·3 per 1000 of the population, estimated at 4,237,387 persons; in the three preceding months the rates had been 3·5, 3·1, and 4·2 per 1000. The lowest rates in October were recorded in Kensington, Hampstead, Stoke Newington, Holborn, and the City of London; and the highest rates in Chelsea, Bethnal Green, Stepney, Southwark, and Bermondsey. The prevalence of scarlet fever showed a marked increase over that recorded in other recent months; this disease was proportionally most prevalent in Chelsea, the City of Westminster, Bethnal Green, Bermondsey, Wandsworth, and Lewisham. The Metropolitan Asylums Hospitals contained 1180 scarlet fever patients at the end of the month, against 644, 615, and 807 at the end of the three preceding months; the weekly admissions averaged 177, against 101, 83, and 138 in the three preceding months. Diphtheria was more prevalent than it had been in any of the preceding months of this year; the greatest proportional prevalence of this disease was recorded in Finsbury, Bethnal Green, Southwark, Bermondsey, Deptford, and Woolwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1070, 1003, and 1111 at the end of the three preceding months, had risen to 1398 at the end of October; the weekly admissions averaged 206, against 142, 122, and 168 in the three preceding months. The prevalence of enteric fever was less than it had been in any of the four preceding months; of the 39 cases notified in October, 5 belonged to Stepney, 4 to Poplar, 3 to Paddington, 3 to Lambeth, and 3 to Battersea. There were 38 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 41, 45, and 46 at the end of the three preceding months; the weekly admissions averaged 3, against 6 in each of the preceding months. Erysipelas was proportionally most prevalent in Chelsea, Shoreditch, Bethnal Green, Stepney, Southwark, and Deptford. The 15 cases of puerperal fever notified during the month included 3 in Islington, 3 in Stepney, 3 in Wandsworth, and 2 in Fulham. Of the 20 cases of cerebro-spinal meningitis 2 belonged to Kensington, 2 to Hammersmith, 2 to St. Pancras, 2 to Shoreditch, 2 to Bethnal Green, 2 to Stepney, and 2 to Lambeth; while of the 7 cases of poliomyelitis 2 belonged to Kensington and 2 to Hammersmith.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the five weeks ending Nov. 3rd, the deaths of 5087 London residents were registered, equal to an annual rate of 12·5 per 1000; in the three preceding months the rates had been 10·9, 10·5, and 11·0 per 1000. The death-rates in October ranged from 9·0 in Hampstead, 9·6 in Chelsea and in Woolwich, 9·8 in the City of London and in Wandsworth, and 10·0 in the City of Westminster, to 14·3 in Stepney, 14·5 in Holborn, 15·0 in Bermondsey, 16·6 in Southwark, 19·1 in Shoreditch, and 19·8 in Finsbury. The 5087 deaths from all causes included 408 which were referred to the principal infectious diseases; of these, 48 resulted from measles, 8 from scarlet fever, 63 from diphtheria, 47 from whooping-cough, 6 from enteric fever, and 236 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded during the month in the City of London; among the metropolitan boroughs they caused the lowest death-rates in the City of Westminster, Holborn, Wandsworth, and Woolwich; and the highest death-rates in Finsbury, Shoreditch, Stepney, Southwark, Bermondsey, and Deptford. The 48 deaths from measles were 30 below the corrected average number in the corresponding period of the five preceding years, and included 14 in Finsbury, 11 in Stepney, 6 in Shoreditch, and 3 each in Islington and Hackney. The 8 deaths from scarlet fever were less than one-half of the corrected average number, and included 2 in Fulham and 2 in Battersea. The 63 fatal

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING OCTOBER, 1917.

(*Specially compiled for* THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1916.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,237,387	—	883	970	—	39	3	15	236	20	7	2173	5·3	—	48	8	63	47	6	236	408	1·0	5087	12·5
West Districts:																								
Paddington	130,668	—	18	29	—	3	—	1	6	—	—	57	4·5	—	—	—	2	—	—	7	9	0·7	161	12·8
Kensington	152,144	—	22	8	—	—	—	—	4	2	2	38	2·6	—	—	—	—	—	1	6	7	0·5	194	13·3
Hammersmith	117,965	—	27	16	—	—	—	—	5	2	2	52	4·6	—	—	—	2	1	—	5	8	0·7	132	11·7
Fulham	149,428	—	30	20	—	—	—	2	4	1	—	57	4·0	—	1	2	1	2	—	8	14	1·0	151	10·5
Chelsea	57,298	—	28	4	—	1	—	—	6	—	1	40	7·3	—	—	—	1	—	—	2	3	0·5	53	9·6
City of Westminster	132,853	—	63	19	—	2	—	—	5	—	—	79	6·2	—	—	—	—	1	—	2	3	0·2	128	10·0
North Districts:																								
St. Marylebone	98,573	—	7	27	—	1	—	—	2	1	—	38	4·0	—	—	—	—	—	—	8	8	0·8	120	12·7
Hampstead	81,470	—	7	12	—	—	—	—	3	—	—	22	2·8	—	—	—	—	—	—	2	2	0·3	70	9·0
St. Pancras	196,812	—	38	52	—	2	1	1	12	2	—	108	5·7	—	2	1	—	6	—	9	18	1·0	262	13·9
Islington	309,359	—	62	68	—	2	—	3	14	—	—	149	5·0	—	3	—	4	2	1	14	24	0·8	368	12·4
Stoke Newington	49,776	—	3	9	—	—	—	—	1	—	—	13	2·7	—	—	—	2	—	—	1	3	0·6	51	10·7
Hackney	209,636	—	46	46	—	2	—	—	12	1	—	107	5·3	—	3	1	6	1	—	10	21	1·0	226	11·2
Central Districts:																								
Holborn	38,161	—	4	5	—	1	—	—	—	—	—	10	2·7	—	1	—	—	—	—	—	1	0·3	53	14·5
Finsbury	74,230	—	14	26	—	—	—	1	1	—	—	42	5·9	—	14	—	2	1	—	7	24	3·4	141	19·8
City of London	20,113	—	1	5	—	—	—	—	—	—	—	6	3·1	—	—	—	—	—	—	—	—	—	19	9·8
East Districts:																								
Shoreditch	99,932	—	12	27	—	—	—	—	11	2	—	52	5·4	—	6	—	3	2	—	12	23	2·4	183	19·1
Bethnal Green	115,552	—	29	52	—	—	1	—	14	2	—	98	8·8	—	—	—	—	1	—	15	16	1·4	125	11·3
Stepney	258,395	—	55	69	—	5	—	3	25	2	1	160	8·6	—	11	—	6	1	—	25	43	1·7	355	14·5
Poplar	156,095	—	31	39	—	4	—	—	4	—	—	78	5·2	—	1	1	1	4	1	9	17	1·1	196	13·2
South Districts:																								
Southwark	177,166	—	39	83	—	2	—	—	18	—	—	142	8·4	—	—	—	8	2	—	20	30	1·8	282	16·6
Bermondsey	113,661	—	63	55	—	1	—	—	10	—	—	129	11·8	—	2	—	1	1	—	17	21	1·9	164	15·0
Lambeth	283,729	—	41	53	—	3	1	—	7	2	—	107	3·9	—	—	—	3	—	—	12	15	0·6	311	11·4
Battersea	159,402	—	33	26	—	3	—	—	13	1	—	76	5·0	—	1	2	2	5	1	6	17	1·1	190	12·4
Wandsworth	310,858	—	80	49	—	1	—	3	13	—	1	147	4·9	—	—	—	4	—	—	9	13	0·4	291	9·8
Camberwell	249,749	—	45	45	—	1	—	—	14	—	—	105	4·4	—	2	—	6	5	1	12	26	1·1	307	12·8
Deptford	107,696	—	18	32	—	1	—	—	15	—	—	66	6·4	—	—	—	1	7	—	9	17	1·6	141	13·7
Greenwich	94,452	—	11	23	—	1	—	1	6	—	—	42	4·6	—	1	1	3	3	—	4	12	1·3	116	12·8
Lewisham	162,901	—	47	29	—	1	—	—	5	1	—	83	5·3	—	—	—	4	—	1	3	8	0·5	177	11·3
Woolwich	130,313	—	19	42	—	2	—	—	6	1	—	70	5·6	—	—	—	1	2	—	2	5	0·4	120	9·6
Port of London	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

cases of diphtheria were 7 in excess of the corrected average number; the greatest proportional mortality from this disease occurred in Stoke Newington, Hackney, Finsbury, Shoreditch, Southwark, and Greenwich. The 47 deaths from whooping-cough were 18 in excess of the corrected average number; this disease was proportionally most fatal in St. Pancras, Shoreditch, Poplar, Battersea, Camberwell, Deptford, and Greenwich. The 6 deaths from enteric fever were equal to half the corrected average number, and included 1 each in Kensington, Islington, Poplar, Battersea, Camberwell, and Lewisham. The 236 deaths from diarrhœa and enteritis among children under 2 years of age were less than two-thirds of the corrected average number; the greatest proportional mortality from this cause was recorded in Finsbury, Shoreditch, Bethnal Green, Stepney, Southwark, and Bermondsey. In conclusion, it may be stated that the aggregate mortality in London in October from these principal infectious diseases was more than 40 per cent. below the average.

Obituary.

FRANKLIN PAINE MALL, M.D. MICH.,

PROFESSOR OF ANATOMY AT THE JOHNS HOPKINS UNIVERSITY, BALTIMORE.

THE death of Dr. Franklin Mall at the comparatively early age of 55 (after an operation for gall-stones) is a sad loss to anatomical science. He performed two great works for the profession in the United States—he introduced new methods of teaching anatomy, and he created a school which has had, through its pupils, a widespread influence. The opening of his laboratory at the Johns Hopkins University in 1893 marks the beginning of an era for the subject in the medical schools of America. Bowditch in Boston, and Newell Martin in Baltimore, with well-equipped laboratories and new methods, had laid the foundation of the modern and flourishing American school of physiology, but anatomy was still a handmaid of surgery and of medicine, and taught in old-time dissecting rooms and in the old way. Mall changed this and made the anatomical laboratory of the medical school a workshop for teaching, training, and investigation. With the true Hunterian spirit he had little faith in lectures, but immense faith in steady, continuous concentration in practical work. "The aim," as he said, "is to make the course one continuous problem for each student to investigate, aiding each one with good material, and teaching him how to study." More stress was laid on origin and function than on the acquisition of the dry details of anatomy. The experimental investigating spirit was too strong in the laboratory to allow any but the weakest men to worry over the minutiæ, and a man's examination was largely the weekly report on the character of his work. Inferior students were mercilessly asked to go elsewhere. The best men in the school were attracted to Mall by the quiet helpful way in which they were taught how to work. His own investigations cover a wide field, and with an unequalled technique for modelling and reconstruction his papers were works of art. The *American Journal of Anatomy*, the *Anatomical Record*, and the *Journal of Morphology* testify to the zeal and ability of his pupils. To few men is it given to revolutionise completely the method of teaching and investigating a subject. This Mall did for anatomy in the United States. W. O.

EDWARD BURD, M.D., M.C. CAMB.,

CONSULTING PHYSICIAN TO THE ROYAL SALOP INFIRMARY.

WITH the death of Dr. Edward Burd, of Shrewsbury, in his ninety-first year, there has passed away a typical representative of the Victorian era. Born in Shrewsbury, educated at Shrewsbury School, serving his medical apprenticeship at the Salop Infirmary, with the exception of the few years at Cambridge University and at St. Bartholomew's Hospital, his whole life was spent in Shrewsbury, where he was for long among the most notable figures. For nearly 60 years he was on the staff of the Salop Infirmary, and his memory went back to the famous Erasmus Darwin, Charles Darwin's father, to Dr. Clements, his own immediate predecessor, a great surgeon who was Member of Parliament for the borough. No wonder that Dr. Burd loved to tell of medical ways and customs now appearing almost mythical; for instance, how he and his fellow-students at the infirmary used to toss up each morning to decide who should do the bleedings and who should do the cuppings. He was a real link between Thackerayean and Listerian medicine.

Dr. Burd's success in practice as a young man seems to have been immediate, and for nearly 50 years he did one of the biggest and most responsible practices in Great Britain. Of iron constitution he seems during this long period of his active life never to have been ill, nor to have known what fatigue meant, although he worked for 30 years without a single day's holiday. A masterful man, virile, direct, and dominant, he inspired the confidence of his patients, who found his intuition and insight wonderful, and his judgment hardly ever at fault. Perhaps the secret of his success lay in the intense personal interest he took in every man, woman, or child with whom he came in contact. He collected people as other men collect pictures, books, or beetles. The practice of his profession was his hobby, and he loved general practice, not so much for any scientific pleasure it gave him as for its personal and human side. As a consultant, his advice was always honestly and fearlessly given; and it must be recollected that complete candour is much more difficult for the local consultant, the friend, perhaps, alike of the patient and the general practitioner, than for the consultant living elsewhere, and called in to represent abstract science at its keenest.

After being obliged through illness to relinquish practice, the special joy of his life had departed, but he continued to take vivid interest in the world around him, and especially in its people and their doings, remaining to the end of his life a power in the county of Shropshire and one whose advice was sought in many capacities. H. W. G.

TIMOTHY HENRY MARTIN, M.R.C.S. ENG., L.S.A.

THE death occurred at his residence at Crawley, on Nov. 5th, of Mr. T. H. Martin, who, until a few years ago when he retired, was a well-known practitioner in North Sussex. Born at Merthyr Tydvil on May 25th, 1837, he received his medical education at St. Thomas's Hospital. He qualified in 1859 and for a short period was surgeon at the Dowlais Ironworks. In 1862 he settled at Crawley, where he quickly gained a wide practice, obtained a number of public appointments, and took an active interest in local affairs. He retired in 1908. Mr. Martin, who was greatly esteemed, married Alice, the eldest daughter of Mark Lemon, the first editor of *Punch*, by whom he had one son and seven daughters. He was a justice of the peace for Sussex.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates were successful:—

Surgery.—C. W. Bower (Section II.), Cambridge and St. Bartholomew's Hospital; R. H. Chadwick (Sections I. and II.), Leeds; I. Harding (Sections I. and II.) Royal Free Hospital; S. Mikhail (Sections I. and II.), Middlesex Hospital; D. Mintzman (Section I.), King's College Hospital; S. G. Mohamed (Section II.), Liverpool; and K. S. Vine (Sections I. and II.), Royal Free Hospital.

Medicine.—J. Behesnilian (Section II.), Charing Cross Hospital; C. W. Bower (Section II.), Cambridge and St. Bartholomew's Hospital; C. G. Bunn (Section II.), Charing Cross Hospital; D. A. Dyer (Section I.), St. George's Hospital; I. Harding (Sections I. and II.), Royal Free Hospital; S. C. Ho (Section II.), Cambridge and London Hospital; D. Mintzman (Sections I. and II.), King's College Hospital; T. F. Reason (Sections I. and II.), St. Mary's Hospital; and K. S. Vine (Sections I. and II.), Royal Free Hospital.

Forensic Medicine.—J. Behesnilian, Charing Cross Hospital; I. Harding, Royal Free Hospital; M. Ibrahim and S. Mikhail, Middlesex Hospital; J. K. Nicole, Westminster Hospital; T. F. Reason, St. Mary's Hospital; G. E. Spero, London Hospital; and K. S. Vine, Royal Free Hospital.

Midwifery.—L. E. Lewis, Glasgow; D. Mintzman, King's College Hospital; J. K. Nicole, Westminster Hospital; and K. S. Vine, Royal Free Hospital.

The diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: C. W. Bower, R. H. Chadwick, S. Mikhail, S. G. Mohamed, T. F. Reason, and K. S. Vine.

MEDICAL SOCIETY OF LONDON.—The next meeting of this society will be held on Monday, Dec. 3rd, at 8.30 P.M., at 11, Chandos-street, Cavendish-square, W. 1, when a discussion on the Surgical and Dental Treatment of Severe Facial Injuries will be introduced by Major H. D. Gillies, R.A.M.C., Captain Kelsey Fry, R.A.M.C. (T.), and Mr. Percival Cole. Colonial and other R.A.M.C. officers are invited to attend.

Professor B. Krönig, Director of the Gynæcological Clinic at Freiburg, died on Oct. 29th at the age of 55 years.

HUNTERIAN SOCIETY.—A meeting will be held on Thursday, Dec. 6th, at 5 P.M., at the Royal Society of Medicine, 1, Wimpole-Street, W., when a discussion on the Medical Classification of Recruits will be opened by Captain Haldin Davis, R.A.M.C.

HARVEIAN SOCIETY OF LONDON.—A meeting of this society will be held in the library of the St. Mary's Hospital Medical School on Dec. 15th, at 5.30 P.M., when a discussion on "Neurasthenia" will be opened by Dr. F. W. Mott, F.R.S.

SOCIETY FOR THE STUDY OF INEBRIETY.—The next meeting of this society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on Tuesday, Jan. 8th, 1918, at 4 P.M., when Sir Robert Armstrong-Jones will open a discussion on "Alcohol and Mental States."

CENTENARIAN.—Mrs. Ann Vickery Ritchie passed away recently at Brighton, at the age of 100. Her hundredth birthday was in August last. She enjoyed good health and remarkable vigour until October, when she fell and broke a thigh.

CENTRAL MIDWIVES BOARD.—Special meetings of the Central Midwives Board were held at Queen Anne's Gate Buildings, Westminster, on Nov. 14th and 15th, with Sir Francis H. Champneys in the chair. Certain midwives were struck off the Roll, the following charges amongst others having been brought forward:—

A midwife being in attendance at a confinement and the patient suffering from persistently offensive lochia, she did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (4). This midwife neglected to take and record the pulse and temperature of the patient at each visit, as required by Rule E. 14, and to enter her record of pulse and temperature in a notebook or on a chart carefully preserved, as required by Rule E. 14. A case being one of abortion, the midwife neglected to explain that it was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (2); she did not carry with her to a confinement the appliances and antiseptics prescribed by Rule E. 3, and did not keep her register of cases as required by Rule E. 24. Being in attendance at a confinement, and the placenta and membranes not having been completely expelled within two hours after the birth of the child, a midwife neglected to hand to the husband or the nearest relative or friend present the form of sending for medical help, properly filled up and signed by her, in order that this might immediately be forwarded to a medical practitioner or to an approved institution, as required by Rules E. 20 and 21 (3). The advice of a registered medical practitioner having been sought under Rule E. 20, she neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (a). Being in attendance previous to and at a confinement and the patient suffering from excessive bleeding, a midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (3); she neglected to disinfect her hands and forearms on each occasion before touching the generative organs of the patient or their neighbourhood, as required by Rule E. 4; and she neglected to wash the patient's external parts with soap and water and to swab them with an efficient antiseptic solution before making the first internal examination, as required by Rule E. 8. The midwife did not on each occasion when attending the patient wear a clean dress of washable material that could be boiled, as required by Rule E. 2.

At the meeting held on Nov. 15th a letter was considered from the general secretary of the Medical Defence Union asking the Board to deal with a complaint made against a certified midwife by a registered medical practitioner. The Board directed that the general secretary of the Medical Defence Union be informed that where a complaint for which an appropriate remedy is provided by due course of law is made against a midwife it is contrary to the practice of the Board to deal with the midwife until the complainant has exhausted his remedy at law. A letter was considered from the clerk of the London County Council asking the Board to take into consideration the opinion expressed by a London coroner that the form of sending for medical help, as prescribed by Rule E. 23 (a), should not specify the name of any particular doctor. The Board decided that the clerk of the London County Council be informed that the Board will take the coroner's suggestion into consideration on the next revision of the rules. A letter was considered from the medical officer of health for Brighton enclosing a draft circular letter which he proposes to send to all midwives practising within his jurisdiction, and asking whether, in the opinion of the Board, he would be acting within his powers by preventing midwives from attending patients suffering from gonorrhœal conjunctivitis while in attendance on other cases. The Board directed that with reference to the circular letter drafted by the medical officer of health for Brighton the reply be: (1) Ophthalmia. The Board agrees that in severe cases of ophthalmia it is very undesirable that the midwife should continue in charge of the eyes, as the disease is highly contagious. But it thinks that special arrangements, under the general supervision of an expert, should always be carried out with the consent of the patient (mother), who has the right to choose the medical practitioner called in accordance to Rule E. 6, and that the case should be visited and the reasons for such special arrangements explained to the mother and midwife by the inspector of midwives or by the medical practitioner called in consultation. (2) Stillbirths. The Board quite approves of the proposed arrangements for the examination of a piece of the placenta in such cases. It thinks, however, that the information as to the presence of syphilis should not be left to the midwife to convey to the parents.

THE King has sanctioned the following appointments to the Order of the Hospital of St. John of Jerusalem in England:—Surgeon-General Thomas Martin Corker, C.B., K.H.P., A.M.S.; Lieut.-Col. Reginald James Cope Cottell, R.A.M.C.; Lieut.-Col. Claude Kyd Morgan, C.M.G., R.A.M.C.; and Major James Fitzgerald Martin, C.M.G., R.A.M.C., to be Knights of Grace.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The National Health Insurance Bill.

THIS Bill has been read a second time in the House of Commons. It deals with questions of finance and the simplification of administration. In the course of his speech, Sir E. CORNWALL, who represents the Insurance Commissioners, stated that during the year 1916 the employers and employed contributed £18,500,000 and the State £5,000,000 to National Insurance. That sum was disbursed as follows: Sickness and disablement benefit, £6,000,000; medical services, £4,800,000; maternity benefit, £1,250,000; sanatorium benefit, £750,000; administration expenses, £2,250,000; balance invested, £8,500,000. A great part of the discussion turned on the relation of solvent to insolvent Approved Societies.

HOUSE OF COMMONS.

THURSDAY, NOV. 22ND.

Review of Exceptions Act.

Mr. MONTAGUE BARLOW asked the Minister of National Service whether, in view of the fact that the Review of Exceptions Act was passed with the definite object of reviewing the cases of some 6000 men, the cases of these men had now all been considered; and whether he could hold out a prospect of introducing a Bill with a view to either restricting or repealing the provisions of this Act.—Sir AUCKLAND GEDDES answered: I am not aware that the Review of Exceptions Act was passed with the object stated in the question. When the Bill was introduced it was stated in this House that it would enable the military authorities to deal with 1,000,000 men, and that it was estimated that 100,000 recruits would be so obtained. At a later stage in the debate certain classes of men were withdrawn from the operation of the Bill and a substituted estimate was given that the number of men available for re-examination would exceed 500,000, and the number to be obtained for military service would be from 50,000 to 60,000. The men liable for re-examination under the Act have in fact not yet been examined. The operation of the Act has been restricted by the concession under which its provisions are not enforced where a man to whom notice has been sent shows that he is a man who has served overseas in the armed forces of the Crown and has been discharged on grounds of health. Moreover, there has been organised refusal to furnish particulars or to attend for medical examination as required by the Act by certain men to whom notices have been sent. I have been in communication with the Public Prosecutor on this question and proceedings are about to be taken to deal with such resistance to the Act. In other respects the Act remains a necessary part of the military service machinery and it is not proposed to introduce a Bill to repeal it or restrict its operation.

Medical Students in the Royal Navy.

Mr. COCHRANE asked the Secretary to the Admiralty whether medical students who were at present acting as surgeon probationers or sick-berth attendants in His Majesty's Navy could not obtain their discharge in order to resume their studies unless they were able to qualify as medical practitioners within nine months, whereas similar students in His Majesty's Army could obtain their discharge for this purpose if they could qualify within three years; and, if so, whether, in view of the shortage of medical practitioners, he would grant equal facilities to medical students in His Majesty's Navy.—Mr. MACNAMARA replied: Medical students who are serving in the Navy as surgeon probationers or sick-berth attendants and who apply for demobilisation for the purpose of sitting for their final examination are granted that permission if they can sit for their final examination within 18 months from

the date of their application. The question of being able to qualify in nine months has never been taken into account in considering such applications. I might add that at the present moment steps are being taken, in conjunction with the Ministry of National Service, with a view to securing that the service of medical students as surgeon probationers shall be limited to six months, but in no case shall exceed 12 months.

Infant Welfare Legislation.

Replying to Mr. CURRIE, Mr. HAYES FISHER (President of the Local Government Board) wrote: The Bill which I am anxious to introduce would be one for conferring on sanitary authorities and county councils in England and Wales the same powers in regard to maternity and infant welfare as were conferred on local authorities in Scotland and Ireland by the notification of Births (Extension) Act, 1915—namely, the power to make such arrangements as they think fit and as may be sanctioned by the Local Government Board, for attending to the health of expectant mothers and nursing mothers and of children who have not attained the age of five years and are not being educated in schools recognised by the Board of Education. I shall be very glad to see the Bill introduced and printed.

MONDAY, NOV. 26TH.

Drill of R.A.M.C. Officers.

Major D. DAVIES asked the Under Secretary for War whether, in view of the demand for doctors for purely clinical work both here and in France, he could state the duration of the period of drill which medical officers who joined the Royal Army Medical Corps had to undergo before they were able to give their full time to the clinical duties of their profession.—Mr. MACPHERSON answered: The duration of the course which includes not only drill but military sanitation, anti-gas protection, and the duties of a medical officer with the troops in the field, depends upon the demands which have to be met for overseas reinforcements and upon the shipping available, but it usually lasts three weeks.

Distribution of R.A.M.C. in France.

Major D. DAVIES asked the Under Secretary for War whether he would state the terms of reference of the committee which, under the chairmanship of General Sir Francis Howard, was now inquiring into the distribution of the Royal Army Medical Corps in France; whether subordinate officers of the Royal Army Medical Corps had been enabled to communicate directly with the committee, or if such communications were only made through their commanding officers; and whether it was proposed that a similar inquiry should be undertaken in this country.—Mr. MACPHERSON answered: This committee was appointed by the War Office on its own initiative, and I think the consideration of such matters as my honourable and gallant friend suggests had better wait until the report is received.

Surgeon-General Sir A. Sloggett.

Major D. DAVIES asked the Under Secretary for War whether Surgeon-General Sir Arthur Sloggett exercised complete control over the Royal Army Medical Corps in France and Belgium; and, if so, whether he was appointed to that position because of his services as Director of Medical Services in India during the period immediately preceding the appointment of Sir W. Babtie.—Mr. MACPHERSON wrote in reply: He exercises control under the Commander-in Chief in France in the same way as any other head of a department in the field. He was sent to France by Lord Kitchener, because no doubt he thought him the best man for the appointment.

Supplies of Carbide of Calcium.

Mr. CATHCART WASON asked the Secretary to the Admiralty whether his attention had been directed to the fact that Dr. Henry P. Taylor was acting as surgeon to the Admiralty, and had received notice that no more carbide of calcium would be supplied him, and, in view of the fact that owing to the long nights in the North much of his work had to be done in the dark, it was impossible to do his work without a supply of necessary light; and whether he would give the matter his consideration.—Sir W. EVANS (Secretary to the Ministry of Munitions) who replied, wrote: So far as I am aware no application for a supply of calcium carbide has been received by the Ministry of Munitions from Dr. H. P. Taylor. Owing to the serious shortage of this material it has become necessary greatly to restrict its use for illuminating purposes. In cases, however, where it is proved that carbide is essential for carrying out Government war work, the Ministry of Munitions, through their priority department, have arranged to supply sufficient quantities for this purpose.

Yorkshire Practitioners and Invalided Soldiers.

Mr. TREVELYAN asked the representative of the National Insurance Commissioners whether he could state the number of York and Yorkshire panel practitioners who had notified their respective Insurance Committees that they were not prepared to accept invalided seamen, marines, and soldiers on their lists under the terms of the new regulations.—Sir E. CORNWALL wrote in reply: No, sir; the number of such doctors in the areas referred to in the question is not known to me. I may add that the regulations in question are framed in accordance with the express desires of authoritative representatives of the medical practitioners concerned, and that events subsequent to their issue have shown that the regulations are, in fact, acceptable to the great majority of such practitioners.

WEDNESDAY, NOV. 28TH.

Medical Boards.

Mr. NEEDHAM asked the Minister of National Service whether he was continuing to work with Local Medical War Committees in regard to the appointment of members of medical boards.—Sir AUCKLAND GEDDES wrote in reply: The answer is in the affirmative.

Mr. NEEDHAM asked whether the members of the medical boards were appointed directly by the right honourable gentleman, and whether he would state the exact method of composing these boards.—Sir AUCKLAND GEDDES replied: Members of medical boards are appointed by the Chief Commissioner of Medical Services on the authority of the Minister. The boards are composed of civilian medical practitioners drawn from a panel set up in the area of each board. The chairman of each board, who is the Deputy Commissioner of Medical Services of this Ministry for an area, arranges with the Local Medical War Committee a roster of attendances of members at sessions of his board. The panels are formed from medical practitioners whose names have been suggested by the Local Medical War Committee; a board of four requires a panel of 8 to 12 members; the nominations reach the Ministry through the Central Medical War Committee, they are reviewed in the medical department of the Ministry and by the Chief Commissioner of Medical Services for the region to which the panel belongs, and finally the appointments to the panels are made by the Minister and notified to the Deputy Commissioner of the area.

Mr. NEEDHAM also asked whether the Central Medical War Committee had any authority in the maintenance of or appointment to membership of national service medical boards; and, if so, whether he would state the exact terms of their authority.—Sir AUCKLAND GEDDES answered: The Central Medical War Committee have no authority in the maintenance of or appointment to membership of national service medical boards. The Committee, through their local organisation, have been asked by the Ministry, having in view the requirements of the civil population, to suggest the names of certain medical practitioners fitted to serve on the boards as stated in answer to the former question asked by the honourable Member. The Central Medical War Committee is the statutory appeal tribunal for the medical profession, and any member of a national service medical board called upon to undertake military service may have his case reviewed by this appeal tribunal. For a full statement as to the authority of this Committee I would refer the honourable Member to the Military Service (Professional Committees Regulations) Order 343 of 1916.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

DORNFORD, C. T., L.R.C.P. Edin., M.R.C.S. Eng., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Lytham District of the county of Lancaster.

JONES, C. R., M.B., Ch.B. Vict., Certifying Surgeon under the Factory and Workshop Acts for the Arnesby district of the county of Leicester.

NOLAN, M. J., L.R.C.S. Irel., Consulting Visitor in Lunacy to the Down District Asylum, Downpatrick.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BERMONDSEY MEDICAL MISSION FOR WOMEN AND CHILDREN.—Female Resident. Salary £150 per annum, with board, &c.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, Birmingham. Clinical Assistant. Salary £50 per annum.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, Birmingham.—House Surgeon. Salary £200 per annum.

BRISTOL GENERAL HOSPITAL.—Casualty House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Surgeon. Salary, if qualified, £150 per annum; unqualified, £100, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

CHARING CROSS HOSPITAL.—Resident Medical Officer. Salary £400 per annum, with board, &c.

DARLINGTON HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—Resident House Surgeon. Also Assistant House Surgeon.

GENERAL LYING-IN HOSPITAL, York road, Lambeth.—Resident Medical Officer for three months. Salary £100 per annum, with board, &c.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary as arranged, with board, &c.

ILFORD URBAN DISTRICT COUNCIL.—Temporary Medical Officer of Health. Salary at rate of £550 per annum.

KENT EDUCATION COMMITTEE.—Temporary School Medical Inspector and Medical Officer of School Clinic. Salary at rate of £385 per annum.

LONDON LOCK HOSPITAL, Dean-street, Soho, W.—House Surgeon for six months. Salary at rate of £150 per annum, with board, &c.

MANCHESTER, CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £400 per annum.

MANCHESTER ROYAL INFIRMARY (CENTRAL BRANCH).—Resident Surgical Officer. Salary £200 per annum.

MANCHESTER SANITARY COMMITTEE.—Female Medical Officer. Salary £400 per annum.

POOLE, BOROUGH OF.—Temporary Medical Officer of Health and School Medical Officer.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Surgeon for six months. Salary £100 per annum, with board, &c.

QUEEN MARY'S HOSPITAL FOR THE EAST END.—House Surgeon.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Female Medical and Surgical Registrars.

SERBIAN RELIEF FUND, 5, Cromwell-road, S.W.—Medical Officer; also Female Doctor for hospital for Serbian civilians.

STOKE-ON-TRENT, COUNTY BOROUGH TUBERCULOSIS SANATORIUM.—Resident Assistant Medical Officer. Salary £250 per annum, with board, &c.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—House Physician. Salary £200 per annum, with board, &c.

WANDSWORTH UNION, ST. JAMES'S INFIRMARY, Ouseley-road, Balham, S.W.—Temporary Assistant Medical Officer. Salary £7 7s. per week, with resident allowances.

WEST LONDON HOSPITAL, Hammersmith road, W.—Clinical Assistants for six months.

WHITTINGHAM, PRESTON, LANCS., COUNTY ASYLUM.—Locum Tenens, unmarried. Salary £7 7s. per week, with board, &c.

YORK COUNTY HOSPITAL.—Female House Physician. Salary £200 per annum, with board, &c.

Births, Marriages, and Deaths.

BIRTHS.

MORTON-WOOD.—On Nov. 26th, at 131, Bromley-road, Catford, S.E., the wife of Dr. S. S. Morton-Wood, of a son.

PHILP.—On Nov. 25th, at Northmoor road, Oxford, Margaret, the wife of Captain C. H. G. Philp, M.B., R.A.M.C., of a son.

ST. JOHNSTON.—On Nov. 21st, at Harrington-gardens, the wife of Captain Adrian St. Johnston, R.A.M.C., of a daughter.

MARRIAGES.

MULLINS—JACKSON.—On Nov. 20th, at Holy Trinity Church, Eltham, Captain H. R. Mullins, S.A.M.C., to Jocelyn Genville Selmes, younger daughter of Mr. and Mrs. F. S. Jackson, of North Park, Eltham, Kent.

SUTTON—WILSON.—On Nov. 20th, at the Parish Church, Rotherham, Surgeon-General Alexander Arthur Sutton, C.B., D.S.O., A.M.S., to Mary Wilson, R.R.C.

DEATHS.

HARVEY.—On Nov. 25th, of wounds, at a casualty clearing station, Gilbert Aberdein Harvey, Captain, R.A.M.C.

INGLIS.—On Nov. 26th, at Newcastle-on-Tyne, on her return from Russia, Dr. Elsie Inglis.

JAMESON.—On Nov. 26th, at 2, Great Cumberland-place, W. 1, Sir Leander Starr Jameson, Bart., P.C., C.B., M.D., in his 65th year. Funeral arrangements will be announced later. No flowers by special request.

YOUNG.—On Nov. 24th, at Westbourne-square, Edward Parker Young, M.R.C.S., L.R.C.P., L.S.A., &c., aged 79.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Nov. 28th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Nov. 22	...	60	56	53	52	53	Overcast
,, 23	...	71	58	51	51	52	Fine
,, 24	...	60	58	47	49	50	Overcast
,, 25	0·02	71	50	41	37	43	Cloudy
,, 26	0·06	53	53	32	31	35	Fine
,, 27	0·49	75	58	35	50	53	Cloudy
,, 28	...	62	56	50	49	50	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

Notes, Short Comments, and Answers to Correspondents.

THE SURGICAL REQUISITES EXHIBITION.

AN interesting exhibition of surgical appliances has just been held in the Grafton Galleries by the Surgical Requisites Association, of 17, Mulberry Walk, Chelsea. This association has done much good work for nearly the whole duration of the war in making surgical appliances of all kinds for the use of the wounded, and it was thought well to hold an exhibition of the products of the skill of the members of the association, at the same time as a fair for the sale of fancy articles for the purpose of repairing the association's finances; and it says much for the broadmindedness of the association that several other societies of like nature were enabled also to show their work. Perhaps the most striking exhibit was the papier maché splints. These are of all sorts and the method is adaptable to practically every part of the body; by means of a solution of cotton in a copper salt it has been found possible to make the splints perfectly waterproof, and their extreme lightness will commend them to every surgeon. They are superior to celluloid in that they are non-inflammable, and as they are comparatively transparent to X rays a skiagram can be taken although the splint is in position. Lastly, these papier maché splints are extremely comfortable, for they always fit exactly, as they are moulded to each individual case. The S.R.A. "Williams" double Balkan support is an independent erection over the bed, fitted with travelling framework suspended from ball-bearing runners on a railway track; there are also swinging booms sliding on the Balkan beams to any alignment of the body required, with pulley attachments for slinging the limbs of patients and for counterbalances. There are also extension bars in various positions, and a lifting framework bed with winding gear for raising separately or together the head and feet. In fact the whole arrangement is most complete and useful, the only fear being that if many more appliances are added to the bed it will become too complicated for use, a possibility which all who have to do much with the working of wards will acknowledge. The Kensington W.H.S. depôt had a large number of exhibits, among which may be mentioned the flexing glove for bending stiff fingers, the Stuart Moore arm flexion splint, and the Sinclair net bed. The P.M. Standard Splint Association had some useful modifications of Thomas's splints. The British Red Cross Society exhibited some convenient patterns of arm and leg splints. The cradle leg splints were especially good. Mr. J. Coryton Roberts showed several ingenious appliances. The "Lanka" sling crutch transfers much of the weight of the body to the hand, in this way relieving the axilla. The "folding cradle" is cheap, effective, and easily stowed away. The "Gladys" bed-table is extremely ingenious, and should prove of the greatest use to those confined to bed. The Clifton bed book-rest is also clever. The whole exhibition demonstrated the great amount of ingenuity and skill lying hitherto dormant among the leisured population of this country.

BOOKS OF REFERENCE.

THAT useful publication, *The Year Book of the Universities of the Empire* (London: Herbert Jenkins. 1917. Pp. 412. Price 7s. 6d. net), which was suspended last year for reasons of economy, again makes its appearance, though in a slightly curtailed form. Readers are referred to the 1915 edition, where full information will be found regarding conditions of admission, degrees, scholarships, residential facilities, laboratories, museums, libraries, and so forth. The names given in the directories of the individual universities in the present edition of the Year Book are those of the incumbents of the offices, whether still fulfilling their duties at the university or otherwise engaged on national service, though in some cases there are omissions, the information not having been received by the compilers. Appendices to the present volume give summaries of the Beit Memorial Fellowships for medical and scientific research, the science research scholarships awarded by the Royal Commissioners for the exhibition of 1851, and the Rhodes Scholarships.—The official book of reference to the Association of Head Mistresses, *The Girls' School Year Book*, 1917 (London: The Year Book Press. Pp. 632. Price 5s. net), contains an alphabetical list of public schools for girls, together with full information regarding terms, fees, hours of attendance, scholarships, names of staff, and other matters of interest to both parents and teachers. A section of the book deals with the future career of girls on leaving school, and particulars are given of various professions and appointments for women.—*The Annual*

Charities and Digest, now in its thirty-sixth edition (London: Longmans, Green, and Co. 1917. Pp. cccIxxvi. + 702. Price 5s. net), is a classified register of charities in or available for the metropolis, together with a digest of information respecting legal and voluntary means for the prevention and relief of distress and the improvement of the condition of the poor. There is an ample index and an introduction, How to Help Cases of Distress, by Mr. C. S. Loch, late secretary to the council of the Charity Organisation Society. Articles on special branches of charitable work include one on Lunatics, Idiots, and Imbeciles, by Dr. H. Rayner, and one on Inebriety and Inebriates, Tuberculosis and the Tuberculous, and Child Welfare, by Dr. T. N. Kelynack.—*British Rainfall*, by H. R. Mill and Carle Salter (London: Edward Stanford. 1917. Pp. 256. Price 10s. net), deals with the distribution of rain in space and time over the British Isles during the year 1916. The records have been made by more than 5000 observers in Great Britain and Ireland. Short articles discuss various branches of rainfall work.

A GENERAL LICENCE FOR THE PURCHASE OF POTASSIUM COMPOUNDS FOR MEDICINAL PURPOSES.

UNDER an Order issued by the Ministry of Munitions, dated Oct. 17th, 1917, no person may offer to purchase, purchase, or take delivery of certain potassium compounds, except in accordance with the terms of a licence. No licence is required (*a*) by the Admiralty or War Office, or (*b*) by any person for the purchase and delivery of potassium compounds in quantities not exceeding in weight an aggregate of 3 lb. avoirdupois during any one calendar month. Caustic potash, chloride, carbonate, and sulphate of potash are the compounds included, while any material applies also of which more than 10 per cent. consists of any one or more of the above compounds. The purchase may be licensed in regard to exceeding the supply of 3 lb. per month, provided that the compounds so purchased are used solely in B.P. form or in B.P. preparations for purely medicinal purposes. By this general licence medical men, druggists, hospitals, and similar institutions are relieved of the onus of applying for individual licences. It will, however, be necessary for wholesale houses in making their returns to the Controller to state the aggregate amount and value of the sales of compounds for purely medicinal purposes during the period covered by each return.

THE CAMERA CLUB.

DURING December the Camera Club (17, John-street, Adelphi, W.C. 2) is showing an exhibition of black-and-white drawings by patients and members of the staff of the 3rd London General Hospital illustrating the humours of ward life as seen by the wounded and their orderlies. Admission, between 11 A.M. and 5 P.M., is free, and tickets can be obtained from any member of the club or on application to the honorary secretary.

A SUBSTITUTE FOR IODINE TINCTURE.

A HIGHLY placed German veterinary surgeon states from long experience that tincture of iodide can be effectively replaced by the following mixture: $FeSO_4$, 5; tannin (dissolved in spirit), 5; acid. carbol. liq., 1; water to 100. Carbolic ink, as he calls it, is stated to be both disinfecting and drying to wounds.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Prof. W. H. Young: On the Series of Legendre.—Mr. L. Hartshorn: The Discharge of Gases under High Pressures (communicated by Hon. R. J. Strutt).—Dr. A. Russell: The Electrostatic Problem of a Conducting Sphere as a Spherical Cavity (communicated by Dr. C. Chree).—Prof. G. N. Watson: The Zeros of Bessel Functions (communicated by Prof. J. W. Nicholson).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Dec. 4th.

PSYCHIATRY (Hon. Secretaries—Bernard Hart, G. F. Barham): at 4.30 P.M.
Paper:
Capt. W. H. R. Rivers, R.A.M.C., F.R.S. (introduced by the President): The Repression of War Experience.

PATHOLOGY (Hon. Secretaries—Gordon W. Goodhart, J. A. Murray): at 8.30 P.M.
Papers:
Dr. W. S. Lazarus-Barlow: An Attempt at the Experimental Production of Carcinoma by means of Radium.
Prof. S. G. Shattock, F.R.S.: Explosive Phenomena in Gunshot Wounds.

Thursday, Dec. 6th

BALNEOLOGY AND CLIMATOLOGY (Hon. Secretaries.—Chas. W. Buckley, J. Campbell McClure): at 5.30 P.M.
Paper:
Dr. C. F. Sonntag (M.O. in charge of the Hydrological Department, Military Orthopædic Hospital, Shepherd's Bush): The Physiological Action of Whirlpool and Manipulation Baths, with Indications for Treatment based thereon.
Dr. Sonntag will also demonstrate the Arthrodynamograph.
(At 7.15 P.M. the members will dine together at Pagani's Restaurant, Great Portland street, W., and members may bring guests. Members who wish to dine are requested to send their names to Dr. Campbell McClure, 59, Harley-street, W. 1)

OBSTETRICS AND GYNÆCOLOGY (Hon. Secretaries—T. G. Stevens, Comyns Berkeley): at 8 P.M.
Discussion:
Scopolamine-morphine Narcosis in Child-birth (Twilight Sleep).
The Discussion will be opened by Dr. J. S. Fairbairn, Dr. C. Hubert Roberts, Mr. T. G. Stevens, and Dr. Herbert Williamson.

Friday, Dec. 7th.

LARYNGOLOGY (Hon. Secretaries—W. D. Harmer, Frank A. Rose): at 4 P.M.
Cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—William Butler, Major Greenwood): at 8.30 P.M.
Presidential Address.
Lieut.-Col. G. S. Buchanan, M.D.: Epidemics of the Easter Campaign.

MEDICAL SOCIETY OF LONDON, 11, Chandos-st., Cavendish-sq., W. 1.
MONDAY.—8.30 P.M., Discussion on Surgical and Dental Treatment of Severe Facial Injuries (introduced by Major H. D. Gillies, R.A.M.C., Capt. K. Fry R.A.M.C.(T.), and Mr. P. Cole.

HUNTERIAN SOCIETY, at the Royal Society of Medicine, 1, Wimpole-street, W.
THURSDAY.—5 P.M., Discussion on the Medical Classification of Recruits (opened by Capt. H. Davis, R.A.M.C.).

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital, Hammersmith-road, W.
FRIDAY.—8.30 P.M., Papers:—Mr. R. Lake: The Methods of Detecting Simulated Deafness.—Mr. P. Dunn: The Methods of Detecting Simulated Blindness.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
Course of Lectures on the Anatomical and Physiological Principles underlying the Treatment of Injuries to Muscles, Joints, and Bones:—
MONDAY.—5 P.M., Lecture V.:—Prof. A. Keith: The Application of Discoveries made by Marshall Hall, C. E. Beevor, and Duchenne.
WEDNESDAY.—5 P.M., Lecture VI.:—Prof. A. Keith: The Bearing of the Discoveries of Modern British Neurologists on Orthopædic Practice.
FRIDAY.—5 P.M., Lecture VII.:—Prof. A. Keith: The Bearing of the Discoveries of British Neurologists (continued).
The Lectures will be illustrated by specimens from the Army Medical Collection now on exhibition in the Museum and also by specimens from the College Collection.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N. 15
MONDAY.—2.30 P.M., Children's Diseases: Dr. T. R. Whipham. Gynæcological Diseases: Mr. F. L. Provis. Surgical Operations: Mr. E. Gillespie. 3 P.M., Medical In-patients: Dr. R. M. Leslie. 7 P.M., Venereal Clinic: Dr. Kinsella.
TUESDAY.—10 A.M., Surgical Operations: Mr. J. Howell Evans. 2.30 P.M., Medical Out-patients: Dr. A. G. Auld. Surgical Out-patients: Mr. Howell Evans. Nose, Ear, and Throat Diseases: Mr. C. H. Hayton. X Rays: Dr. Metcalfe. 3.30 P.M., Medical In-patients: Dr. A. J. Whiting.
WEDNESDAY.—2.30 P.M., Medical Out-patients: Dr. T. R. Whipham. Diseases of the Skin: The Dermatologist. Eye Diseases: Mr. A. S. Worton. Operations:—Nose, Ear, and Throat: Mr. Hayton; 4 P.M., Eyes: Mr. Worton. 3.30 P.M., Special Demonstration:—Mr. T. H. C. Benians: The Detection and Treatment of Disease "Carriers" in Private Practice. 5 P.M., Venereal Clinic: Mr. E. Gillespie and Mr. Benians.
THURSDAY.—2.30. P.M., Medical Out-patients, Dr. A. J. Whitngt Surgical: Mr. H. W. Carson. X Rays: Dr. Metcalfe. Gynæcological Operations: Dr. A. E. Giles. 3.30 P.M., Medical In-patients: Dr. R. M. Leslie.
FRIDAY.—2.30 P.M., Surgical Out-patients: Mr. Gillespie. Eye Diseases: Mr. A. S. Worton. 7 P.M., Venereal Clinic: Mr. E. Gillespie and Mr. Benians.
SATURDAY.—2.30 P.M., Surgical Operations Mr. H. W. Carson.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.
THURSDAY.—5 P.M., Chesterfield Lecture:—Dr. M. Dockrell: The Ringed Eruptions of the Skin.

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IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

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Y.—Sir Arthur Yapp, Lond.

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